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THE SPHERE, JANUARY 8, 1944
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THE SPHERE

Vol. CLXXVI No. 2294 WITH WHICH IS INCORPORATED THE GRAPHIC JAN. 8 1944

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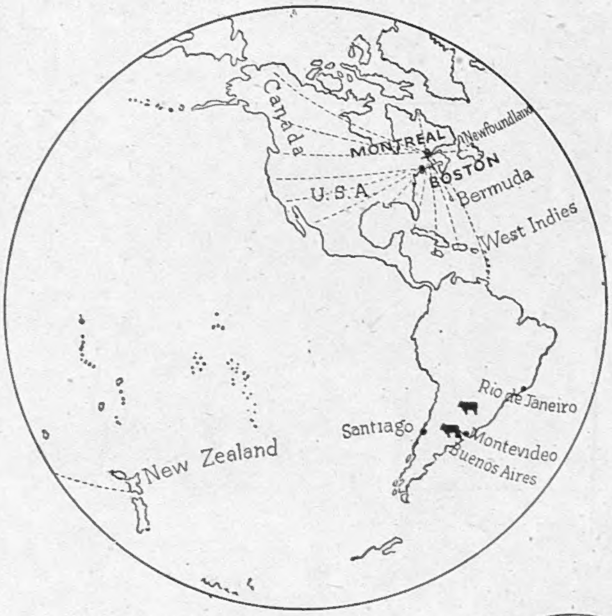

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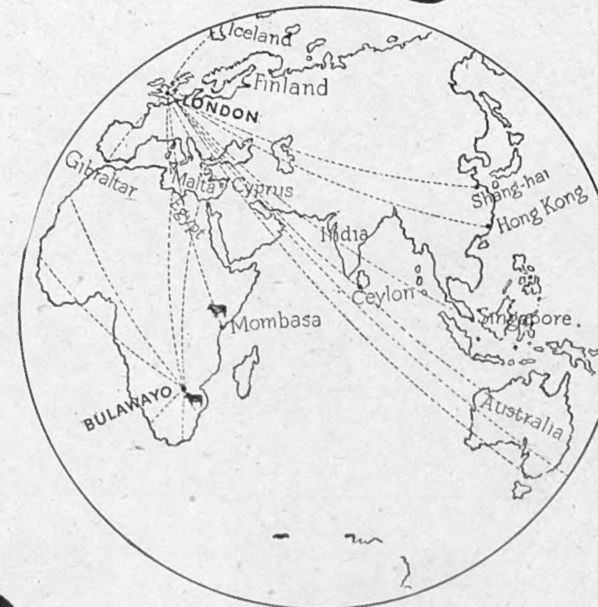

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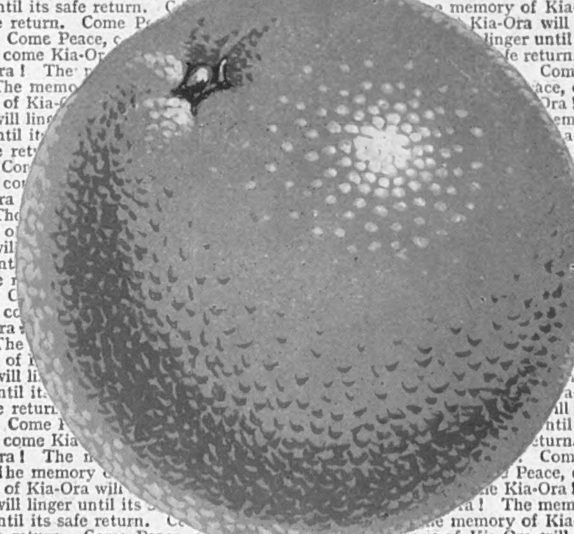

Come Peace, come Kia-Ora ! The memory of Kia-Ora will linger until its safe return. Come Peace, come Kia-Ora ! The memory of Kia-Ora will linger until its safe return. Come Peace, come Kia-Ora ! The memory of Kia-Ora will linger until its safe return. Come Peace, come Kia-Ora ! The memory of Kia-Ora will linger until its safe return. Come Peace, come Kia-Ora ! The memory of Kia-Ora will linger until its safe return. Come Peace, come Kia-Ora ! The memory of Kia-Ora will linger until its safe return. Come Peace, come Kia-Ora ! The memory of Kia-Ora will linger until its safe return. Come Peace, come Kia-Ora ! The memory of Kia-Ora will linger until its safe return.

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Volume CLXXVI No. 2294 The SPHERE, London, January 8, 1944

THE SPHERE
With which is incorporated "THE GRAPHIC"
The Empire's Illustrated Weekly

MR. CHURCHILL REGAINS HIS STRENGTH IN THE SUNSHINE : AFTER HIS ATTACK OF PNEUMONIA, THE PRIME MINISTER IS AGAIN ALLOWED TO SIT UP and take the air in the open. This is the first picture of him since his illness in the Middle East

On December 16 the first announcement of the Prime Minister's illness was made to a startled House of Commons. Since then, however, the patient has made rapid progress, and, under careful medical attention, has recovered in good fashion. In a personal message issued by him from 10, Downing Street on December 29, Mr. Churchill said that "a few weeks in the sunshine are necessary to restore my physical strength," and that he was going away to an unknown destination to recuperate. This picture was taken during the distinguished patient's convalescence : the Prime Minister is seen well wrapped up in his famous "siren suit" and a dressing-gown, after he had been allowed by his doctors to spend a little time out in the sunshine. During the course of his personal statement, Mr. Churchill revealed that not at any time had he to relinquish his part in the direction of affairs and that he is now able to transact business fully. Spread out on his knee in the above picture are maps which he was obviously studying whilst the photographer was at work

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A WAR NEWSLETTER —No. 227

1, NEW OXFORD STREET, W.C.1.

Commanders in the Field.

—There is something still of old-world "chivalry" in the democratic way of waging total war. As I ventured to say the other day, if the Nazis were rabbits, our slow-motion, deliberate steps and announcements regarding the impending fortress-crashing would by now have mesmerised them into a dither. When we attack the Nazis, we often discover the name of the directing enemy commander by chance in the course of operations. (It is, it is *not*, the elusive Rommel or what not!) Our way is the way of Jan Ridd in his death grapple with Carver Doone. We put our cards all on the table in advance and offer the wrestler's favour to our foe, take off our tunic and neatly fold it up. We shall attack him from the Mediterranean, from Italy and from Britain, and such and such generals will be responsible in this and that area. . . . The only information we withhold is the day fixed for each engagement. And, I doubt not, this is a very good way. And since the men named are all good men and generals, big-hearted and experienced, the names make news which may hearten the Allies and depress the Huns. These are names linked with many recent solid achievements on the battlefield, names which leave no loophole for Nazi hopes of bickering and jealousy and divided councils. Some talk of Alexander and some of Eisenhower, of Spaatz, Montgomery, Wilson, all men of proven power. They know each other, know their men and their men know them. And now nothing remains to know but zero hour. And since it must be, the sooner that news is known, the better. Il faut en finir.

Exit the "Scharnhorst."

—It takes a hundred years (or two) to give to the general public that vague comprehension of the technicalities of warfare which enables them to follow with thrilling interest, and some slight understanding, the details of a battle. A battle at sea is still most likely to evoke our interest. We have followed such epics since 1588 and are beginning to "know our way about." Yet, oddly enough, in recent times famous sea victories fought between capital ships have not always seemed (mathematically) romantic. To the layman it may sometimes have seemed that victory lay with the longest ranging guns and certain defeat awaited the ship engaged by an enemy of superior range and weight. But always the romance of human courage redeems the mathematical certainty of victory as well as of defeat. The victory may be achieved before the shooting begins. And nowadays there are smaller satellites which surround the capital sun and perform their glorious parts in the victory. The *Scharnhorst* went down fighting in the Arctic night and we know that a glorious page in naval history is preparing for us and for our children's children. Our experience of land warfare also enables us to appreciate the great historians of battles-on-land, from Hastings to Salerno—from Malory to Churchill and Napier. "Nothing could stop that incomparable infantry"—we can appreciate that fine phrase, after centuries of experience—even if, still as of old, the art of war seems to be a matter of choosing your subordinates and trusting them, keeping and using at the right moment your reserves, and enveloping your enemy on the left or on the right flank. We have not a hundred years of experience as yet of air warfare—no more indeed than thirty. These air battles are splendid and thrilling romances of sheer courage and superhuman skill. I don't think we are yet in a position to read of them with any glimmer of comprehension of the technique which constantly changes, nor yet to put ourselves in the cockpit, or the bomb-aimer's or the machine-gunner's or the navigator's place, as we can by experience put ourselves in the ranks of the infantry or in the gun turret or the stokeholds. The *Scharnhorst* is sunk, the German Navy very much crippled for the duration, and another great Sea Saga is on the way to the bookstalls.

The Hopes of a New Year.

—They are high hopes, those of 1944—so high that we may well doubt, in the darkness before the dawn, whether such a sun can rise, whether we are worthy of such a rising. I thought these thoughts when I read over the King's Christmas broadcast. A King of England has to-day no more essential function than to see the best that is in his peoples and to typify and inspire the best by constant example. And that is a big job for one man, and one man is doing it well. You and I are called to high, but less high, function. Our radius is smaller; I think also our means of finding out the truth and the best about our nation are neither so full nor so precise. The truth is, the more a man goes about among all sorts and conditions of men, the shrewder will be his knowledge of the heart of the nation. You and I (many of us) form our conception of the worth of this nation from misleading or partial sources. I think it would be fair to say—without detracting from the high average merit of our press—that if a man judged of Britain solely from the matter daily printed in the sum of the Press—he might well decide that that sun will never rise and that we are not worthy that it should rise. There is much which is noble and inspiring printed daily; there is much which is depressing, petty, and shoddy. If we believed that the sum total of our press publications gave us each day a mirror of the heart of our nation, I do not think we should cross the frontier of 1944 in remarkably high spirits. Rather let us believe that, high as, on the whole, are the standards of British journalism, yet, for various reasons connected with the economy of journalism, the press presents no true mirror to the heart of Britain, and the British race is still inarticulate, unchronicled and unrepresented. You must go about among the people everywhere, every day and all the time if you wish to discover the truth and the worth of the man in the street, and see the best in him. If you do that, you may acquire great faith in the rising of such a sun as Britain has not known in living memory.

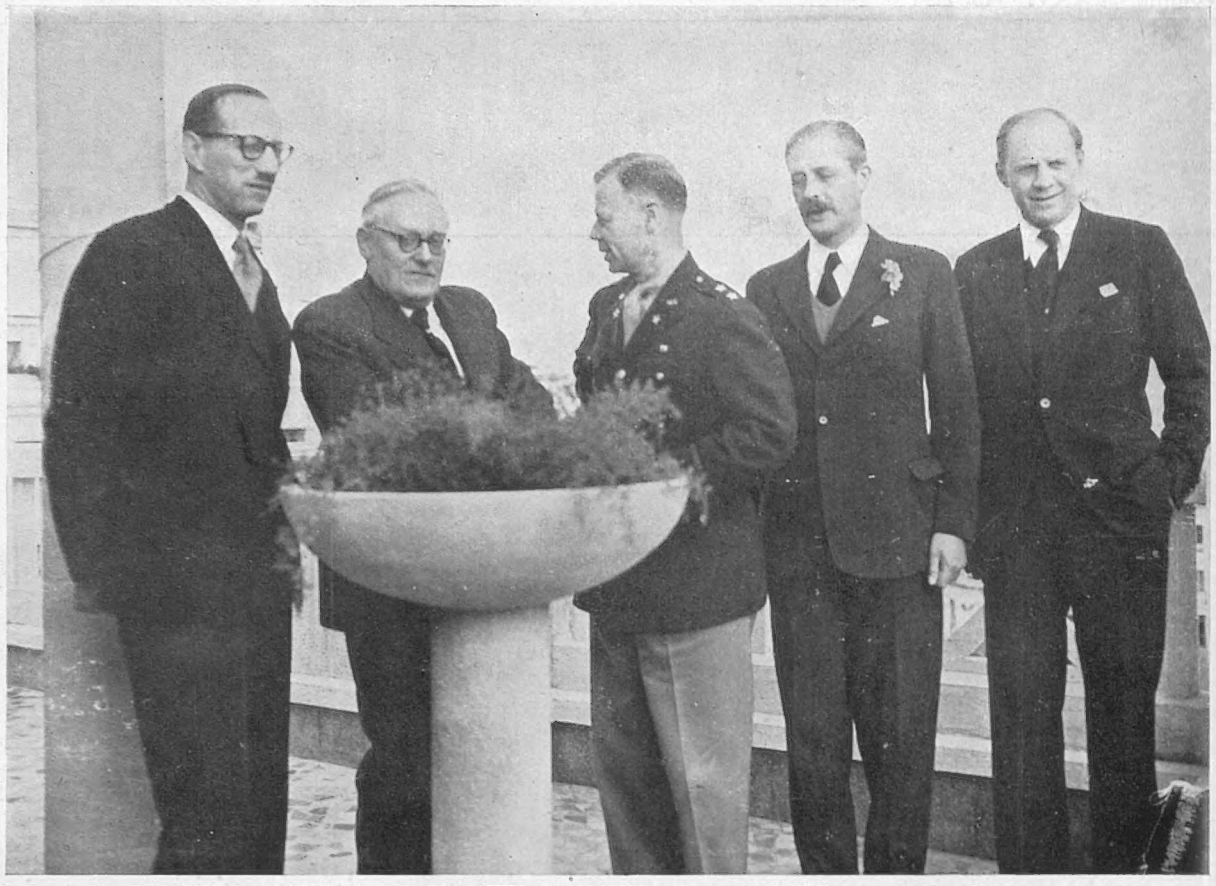
A Year (and a Half)!—

And now at last the painful cultivation of my "five-year plan" has borne fruit. I am writing my diary for 1944 beneath the parallel column of 1943, day by day. And every day will inevitably supply its thrilling contrast or its stimulating parallel in matters big and small. The contrasts will predominate at first, for we were still shy of our new-born confidence when the fourth year opened. I should say that we did not graduate in the school of confidence until January 23 when, on the eve of the Casablanca meeting, we received the triple crown of news that Montgomery was in Tripoli, the Russians in Armavir and the forces of MacArthur had cleared Papua. After that, we began to feed and grow fat on confidence and soon forgot the memory of fast days in the rich banquets of that wonder year. I decided weeks ago to attempt no review of the year 1943. Others will do it better. I cannot claim to have even partially digested the Lucullus feast. I enter the year 1944 ill-prepared emotionally and digestively for promised feasts which are to put those of 1943 into the category of snacks. I shall content myself with smaller, more domestic matters for comment. On January 1, 1943, primroses and *pirus japonica* were in bloom and we had not felt the breath of winter. That was good. We had a houseful of mumps—that was not so good. I read between the lines of my jottings that, despite the miracles which had recently transformed our fortunes and outlook, we entered 1943 far more war-weary than to-day after another long and testing year of total war. Our armies, our Navy, our Air Force, have proved themselves again and again second to none in the history of to-day and of yesterday. We have had jolts and setbacks, of course. Those that stick out farthest in my memory are domestic—a doubt as to whether as a people we shall tackle success with as much dignity as we tackled disaster. And, exceptionally, a jolt to our faith in one of our most prized institutions, the High Court of Justice. The Hereford case was quite a tremendous trifle.

Flying Dangers.

—Wars have proved the best mothers of invention. No invention of our time (unless in the field of medicine) owes more to wars than the aeroplane. The years 1914-18 put an unknown continent on the map in clear detail. The years 1939-44 will have made of the aeroplane the "penny-bus" of all civilised peoples. Certainty of performance in every type of weather and temperature, with a hundred devices to guard against unforeseeable chances, have emerged from these testing years of war. And yet (I suppose, in my total ignorance of flying) much remains to do. Nothing is ever *done* or perfect in human activities. And it may be that radical and intense research is still called for to ensure for the aeroplane (and, above all, under war conditions) a much higher security against the obvious dangers which beset a machine propelled by a highly inflammable fuel. No doubt there are many devices in regular use to reduce the danger, from fireproof bulkheads to super extinguishers. But the fuel remains—highly combustible. In what direction the search after safety will turn, I do not know. Inventors and designers must have been alive to the needs for years and years. Indeed, long before the War there were indications that a Diesel engine might one day supersede the petrol engine for flying propulsion, but I imagine that hitherto the petrol engine has always kept ahead of any rival. If that be so, and if this most inflammable of fuels remains, and is to remain, Civilisation's best expedient for air transport, then indeed, if "railroad safety" is to be attained in our time, there must be no slackening in the efforts of inventors and controllers of flying to improve the means of preventing and extinguishing fires.

THE OLD STAGER



THE ITALIAN ADVISORY COUNCIL MEETS IN ALGIERS. The principal figures at the first meeting

This body, set up after the Moscow Conference, has just met under the chairmanship of M. Rene Massigli. Subsequent meetings are to be conducted under a rotating chairmanship In this picture the following members of the Council are seen: from left to right—M. Rene Massigli, Foreign Affairs Commissioner of the French Committee of National Liberation; M. Andre Vyshinsky, U.S.S.R. delegate; Major-General W. B. Smith, General Eisenhower's Chief of Staff; the Rt. Hon. Harold MacMillan, British delegate; and Mr. Robert D. Murphy, representing the United States

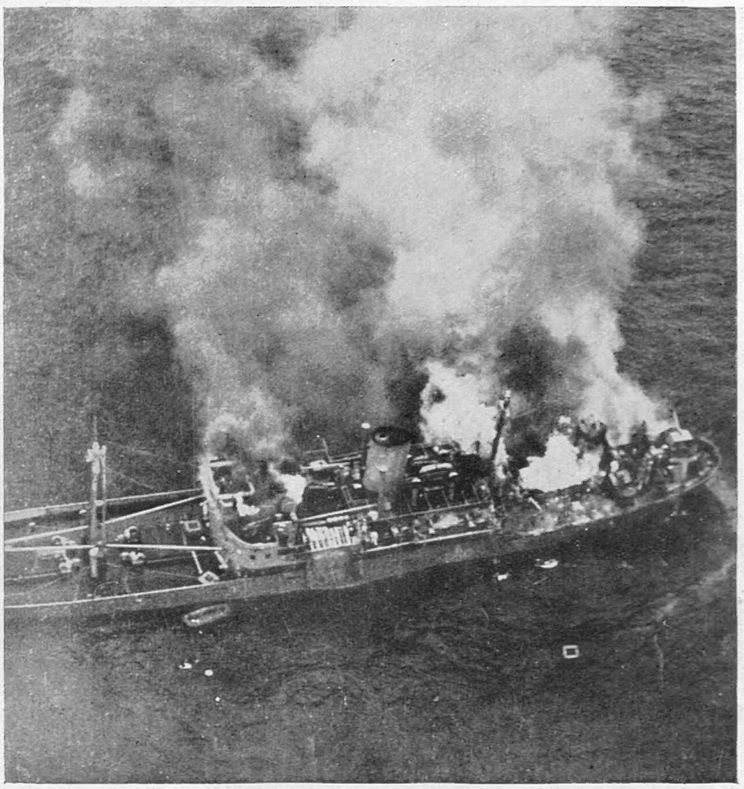
THE ARRIVAL OF THE "SCHARNHORST" SURVIVORS

The British Officers who Took Part in the Action: And the Sinking of the German Blockade-Runner in the Bay of Biscay

THE SURVIVORS OF THE "SCHARNHORST": A wounded German seaman being slung from the "Duke of York" to a hospital drifter after the return of the British Home Fleet to its base

On pp. 38-39 of this issue we publish drawings and diagrams of the destruction of the German battleship *Scharnhorst* by the Home Fleet on December 26. The pictures reproduced here show the final scenes—the return to port of the Fleet with the few German survivors of the action. The 26,000-ton battleship had a crew of 1,460 officers and men. Thirty-six of these were picked up from the icy waters, and it is considered unlikely that any other survivors escaped on rafts or floating wreckage—so that the enemy lost over 1,400 of his picked naval personnel

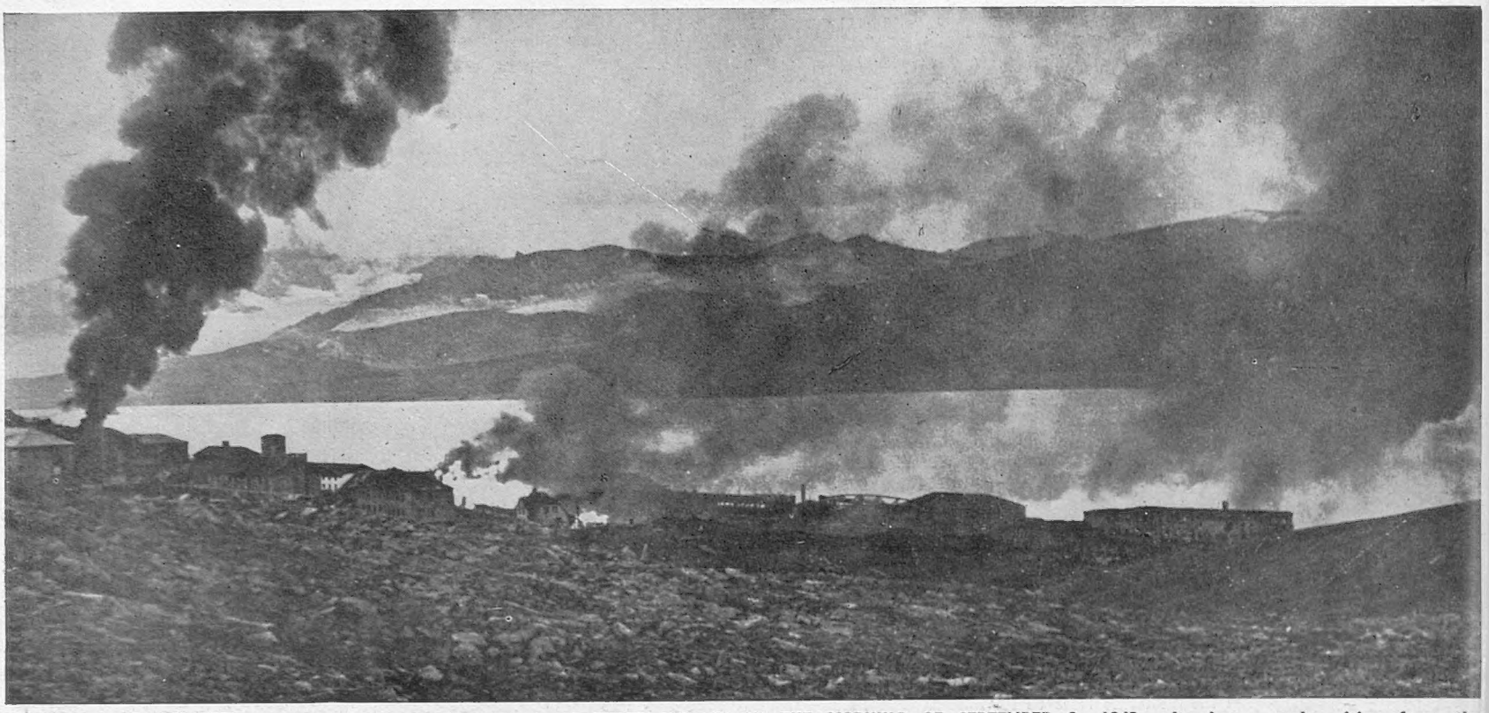
On right—On the day following the destruction of the *Scharnhorst* a Liberator aircraft of a Czechoslovak Squadron of the R.A.F. Coastal Command intercepted and destroyed a German blockade-runner in the Atlantic. Next day, aircraft of Coastal Command and U.S. Naval planes, working with two British cruisers, located a force of enemy destroyers in the Bay: these, it is believed, had probably gone out to escort the blockade-runner. Three of the enemy warships were sunk and others damaged, and R.A.F. Mosquitoes shot down a German He. 177. The picture above shows the end of the German blockade-runner



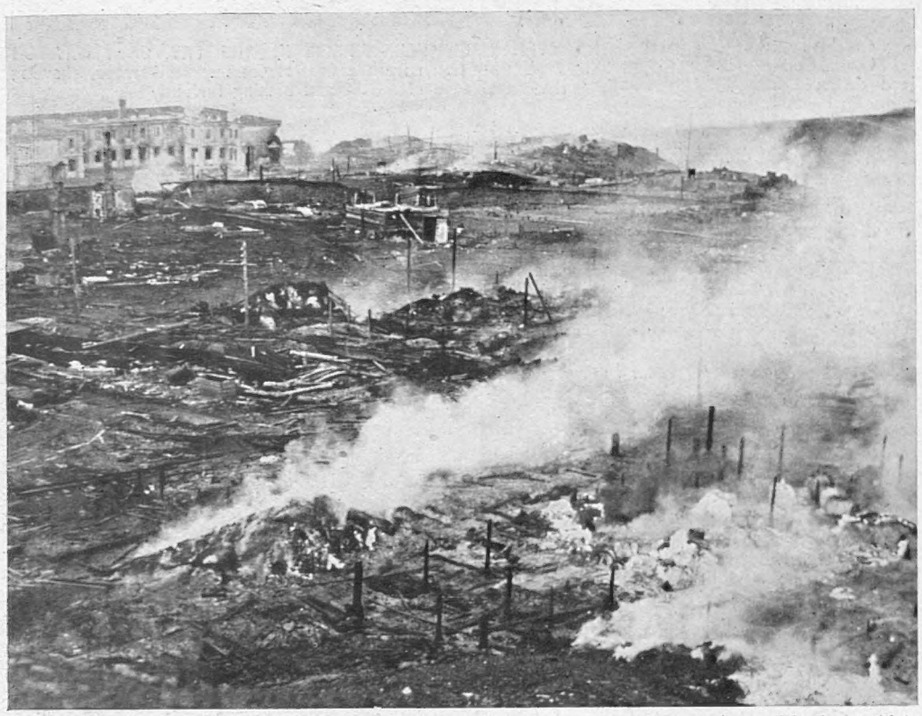
THE END OF THE GERMAN BLOCKADE-RUNNER IN THE BAY OF BISCAY ON DECEMBER 27. A picture, taken from a Coastal Command Liberator, showing the vessel at a standstill and blazing furiously

SOME OF THE GERMAN SEAMEN FROM THE "SCHARNHORST" UNDER GUARD ON THE CATAPULT DECK OF THE "DUKE OF YORK." Only thirty-six men were picked up out of the water after the German battleship had gone down, so that over 1,400 enemy officers and men perished when the pride of the German Navy was sent to the bottom

AFTER THE HOME FLEET HAD RETURNED TO ITS BASE: Admiral Sir Bruce Fraser, Commander-in-Chief, with some of the officers of the warships which took part in the action. From left to right are—Captain the Hon. Guy Russell (Captain of the "Duke of York"); Commander J. Lee Barber, D.S.O. (H.M. Destroyer "Opportune"); Commander R. L. Fisher, D.S.O. (destroyer "Musketeer"); Commander M. D. C. Meyrick (destroyer "Savage"); Admiral Fraser; Captain J. Hughes Hallett, D.S.O. (Captain of the cruiser "Jamaica"); and other destroyer officers



BARENTSBERG ON FIRE: THIS PHOTOGRAPH WAS TAKEN AT THREE O'CLOCK ON THE MORNING OF SEPTEMBER 8, 1943: It shows smoke rising from the burning buildings of the mining settlement shortly after the German battleships had begun their bombardment



BARENTSBERG AFTER THE RAID. These smoking ruins faced the Norwegian garrison with the problem of improvising shelter against the coming Arctic winter

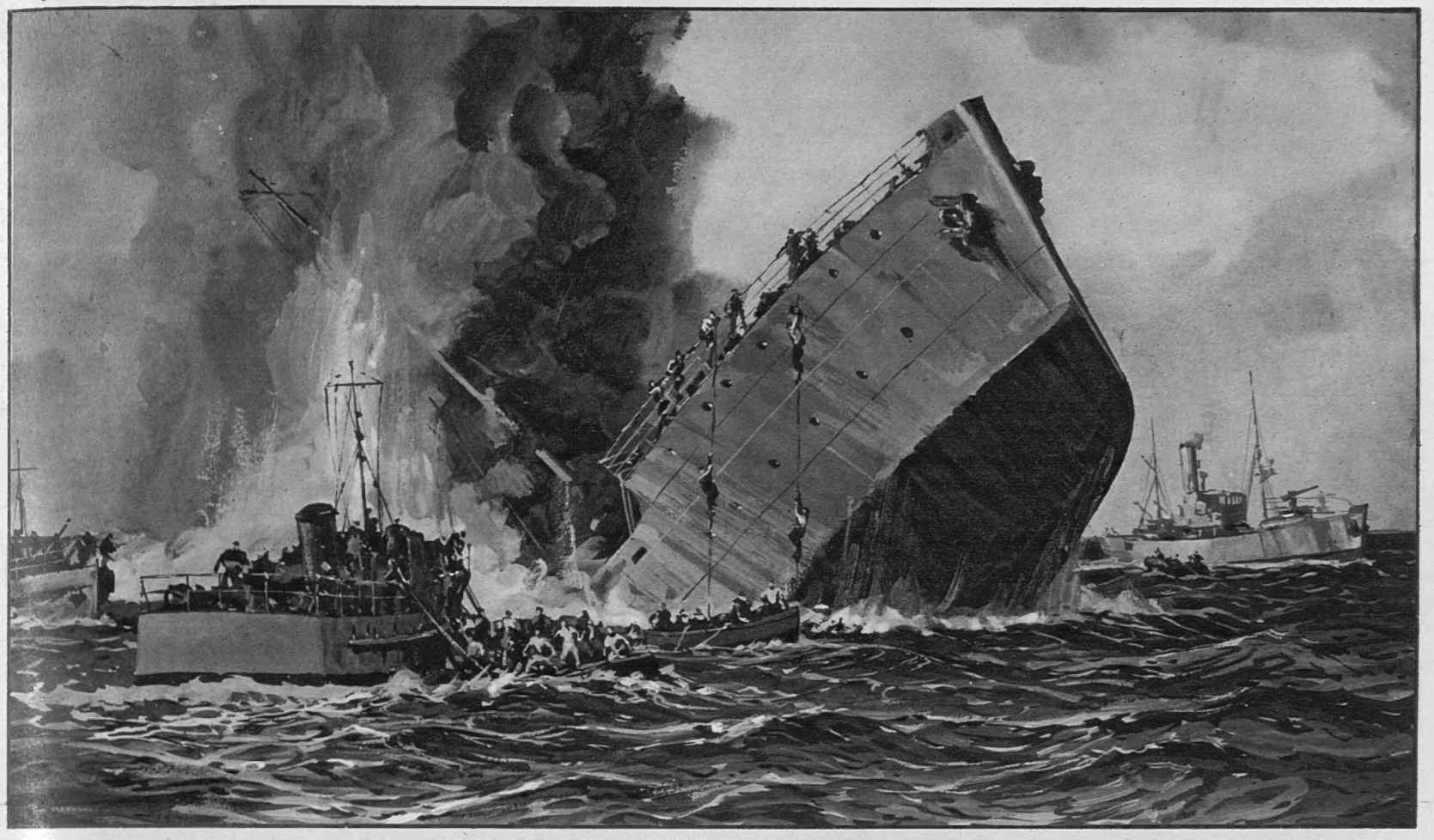
CARRYING BACK THE WOUNDED. Norwegian soldiers returning from the mountains with a wounded comrade to the fire-scorched settlement of Barentsberg

WHEN THE "SCHARNHORST" RAIDED SPITZBERGEN IN SEPTEMBER 1943

WOUNDED HIDDEN UNDER THE ICE. Forced to withdraw to the mountains, the Norwegian troops were constantly harassed by German planes. They hid their wounded comrades under ice ridges left in the ravines, collecting them again after the Germans had retired

One of the last mission carried out by the *Scharnhorst* was the inglorious attack on Spitzbergen. This was carried out on September 8, 1943. On that day a large German naval force comprising the *Tirpitz* and *Scharnhorst*, with a destroyer escort, raided the lonely Arctic outpost of Spitzbergen, 10 deg. from the North Pole. The two principal mining settlements, Barentsberg and Longyear City, were bombarded and set on fire, and landing parties from the German vessels were put ashore. After razing the settlements to the ground, the Germans ingloriously retired to their hide-out in the Alten Fiord in North Norway

CONVALESCING AT 78 DEG. N. A Norwegian soldier, wounded during the raid, sits outside the hut and turns the pages by means of a stick held between his teeth



AN ENGAGEMENT BETWEEN BRITISH LIGHT NAVAL FORCES AND AN ENEMY CONVOY OFF YMUIDEN IN THE NORTH SEA. A Nazi supply vessel is hit by torpedoes and throws its bows 30 ft. up into the air before sinking—*Drawing by Wm. McDowell*

ACTIONS AT SEA

Two Recent Incidents during Naval Engagements in the North Sea and in the Pacific

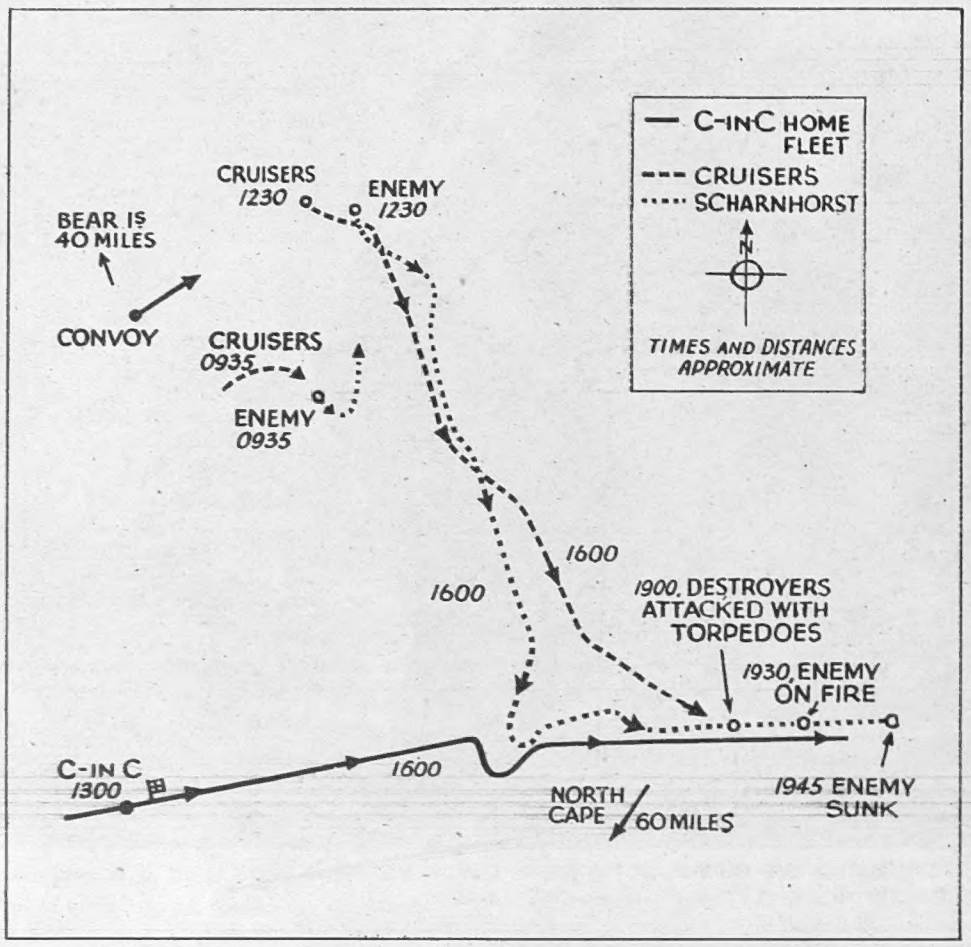
The drawing reproduced here re-creates the scene during a brush with a Nazi convoy in the North Sea, recently reported by the Admiralty. During an offensive sweep in the vicinity of Ymuiden, off the coast of Holland, in the early morning of December 10, light Coastal Forces of the Royal Navy encountered an enemy convoy of four merchant ships escorted by four E- or R-boats and several armed trawlers. Our vessels pressed home their attacks to close range and scored hits with torpedoes on one of the supply ships. When this vessel was last seen by our men before they set back to their base, 30 ft. of its bow was protruding from the surface of the sea at an angle of about 45 degrees, and German vessels of the escort were picking up the survivors. Our ships all returned safely to harbour—with no damage and no casualties

WHEN THE AMERICAN ESCORT-CARRIER "LISCOMBE BAY" SANK IN NOVEMBER LAST off the Gilbert Islands in the South-West Pacific. The scene as the great heat twisted the vessel's plates after she had been set on fire and heavy explosions had taken place in her magazines and fuel tanks—*Drawing by Wm. McDowell*

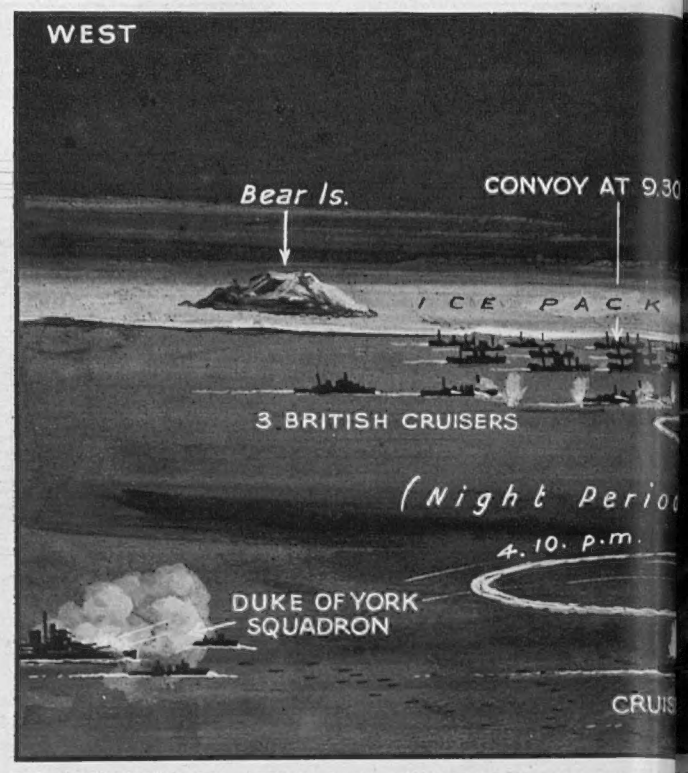
When the *Liscombe Bay* was sunk off the Gilberts many of her crew lost their lives. She was torpedoed by a submarine near Makin Atoll early on November 24. Immediately there were heavy explosions, as her magazines and fuel-tanks went up, and the oil spread the fires among the bombed-up aircraft, whose torpedoes blew up on the flight deck. Soon the whole ship was twisted and crumpled, and aflame from stem to stern. An officer described how the red-hot sides of the ship hissed as she sank lower in the water before going down by the stern fifteen to twenty minutes after the torpedo hit. The manner in which fire in a ship can twist and distort the hull is almost unbelievable. The terrific heat generated in the various compartments (particularly if the fire reaches the oil fuel) causes a sudden expansion of the steel structure, and, as certain parts—chiefly those below water—are kept cooled by the sea, this expansion is irregular and crumples the hull to an extent which has to be seen to be believed

THE DESTRUCTION OF THE "SCHARNHORST"

On December 26 by the Home Fleet, near Bear Island within the Arctic Circle



THE CHASE AND THE KILL: The Admiralty chronological diagram of the Battle off North Cape, showing the courses taken by the three naval forces engaged: the "Duke of York" is indicated by a continuous black line, the cruisers by a broken line, and the "Scharnhorst" by a dotted line



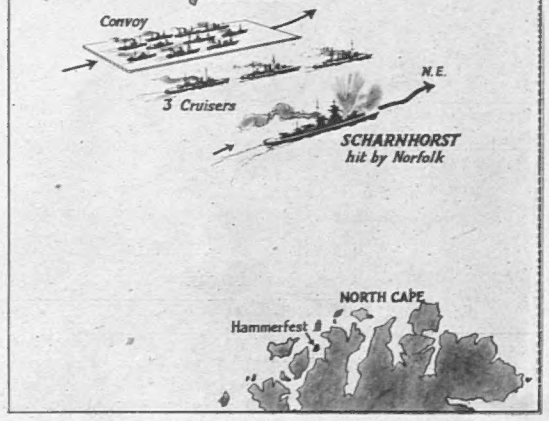
THE "SCHARNHORST" ACTION TOOK PLACE PARTLY IN THE "ARC... that hour the half-light began to fade and darkness came

It is now known that the British force was disposed in two main formations. One, under the immediate command of the Commander-in-Chief, Admiral Sir Bruce Fraser, flying his flag in the battleship H.M.S. *Duke of York*, was covering the convoy at a distance against possible attack by enemy ships based in Northern Norway. With him was H.M.S. *Jamaica* and four destroyers. The second formation, consisting of the cruisers *Belfast*, *Norfolk* and *Sheffield*, was under the command of Vice-Admiral R. L. Burnett, flying his flag in the *Belfast*.

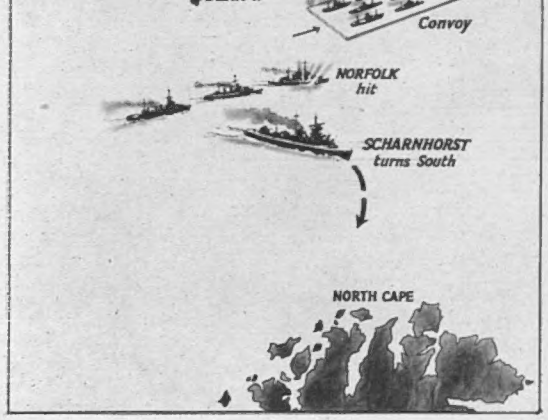
The Cruiser Squadron was escorting the convoy in a position to the south-east of Bear Island when, in the half-light of an Arctic dawn, contact was first made with the *Scharnhorst*.

Cruisers and destroyers continued to shadow the *Scharnhorst* throughout the afternoon,

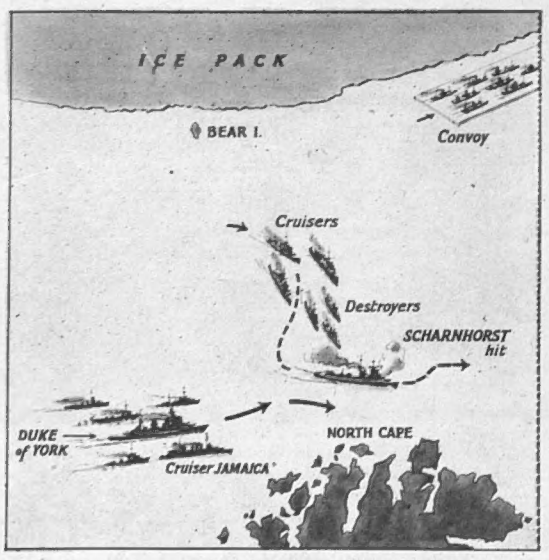
VICTOR: Admiral Sir Bruce Aus... Fraser, Commander-in-Ch... of the British Home Fl...



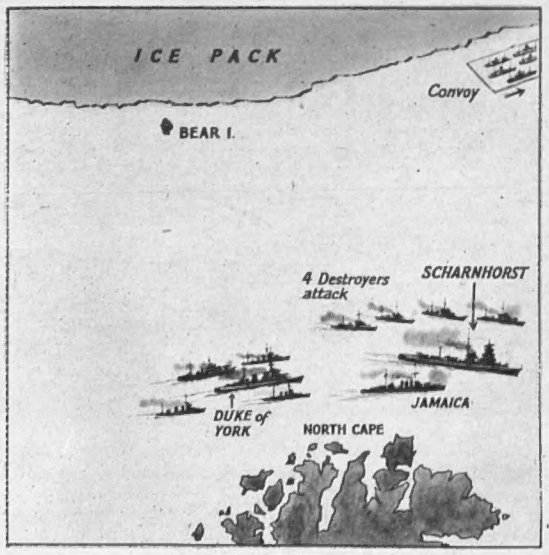
1. The cruisers "Belfast," "Norfolk" and "Sheffield" open fire on the "Scharnhorst," and the convoy is ordered to turn towards the north-east



2. The "Scharnhorst" turns south after having hit the "Norfolk" and after an attempt to close with the convoy

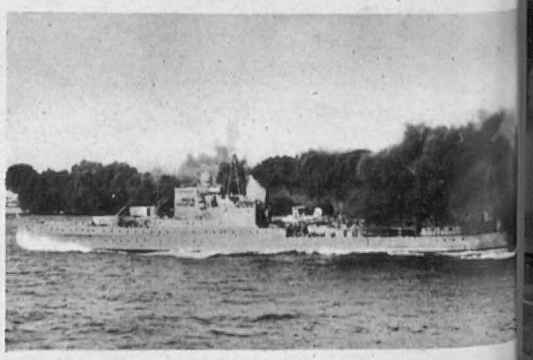


3. The "Duke of York," the cruiser "Jamaica" and four destroyers attack the German battleship: after turning back, she heads due east



4. The "Scharnhorst" torpedoed: Bombarded by the "Duke of York," she is on fire and sinks at 7·45 after being torpedoed by "Jamaica"

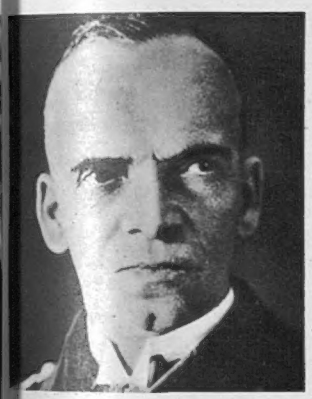
THE CRUISER "JAMAICA," which was in at the ... and which finished off the German battleship ... a final torpedo attack



THE CRUISER "SHEFFIELD," which, with the "Belfast" and "Norfolk," drove the "Scharnhorst" into ... destroyer torpedo ambush

H.M.S. *Jamaica*, a cruiser of the Fiji class, has taken part in ... important actions in northern waters. She was designed under ... restrictions of the London Naval Treaty, and is a triumph of ... design and construction; her armament, speed and endurance ... have required much more than her displacement of 8,000 ... few years ago. H.M.S. *Sheffield* is a cruiser of the Southampton ... She was launched on July 23, 1936. Built and engined by ... Vickers-Armstrong, she has a displacement of 9,100 tons, a leng... 558 ft., and carried three aircraft at the time of her launching.

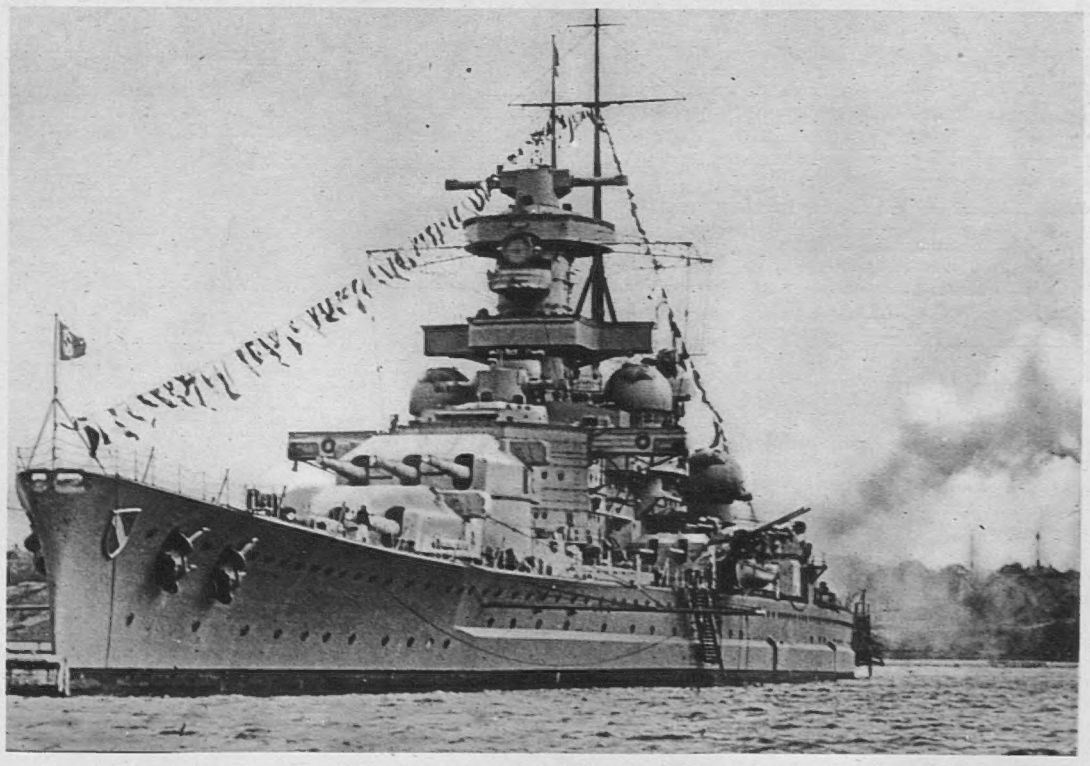
WILIGHT" OF MIDDAY ON DECEMBER 26 and partly in the "Arctic night" of the following hours. "Twilight" lasted from about 11 a.m. to 1 p.m.: after he ships must have gone through a period of great tenseness as they forged ahead: searchlights and star shells doubtless played their part at critical moments



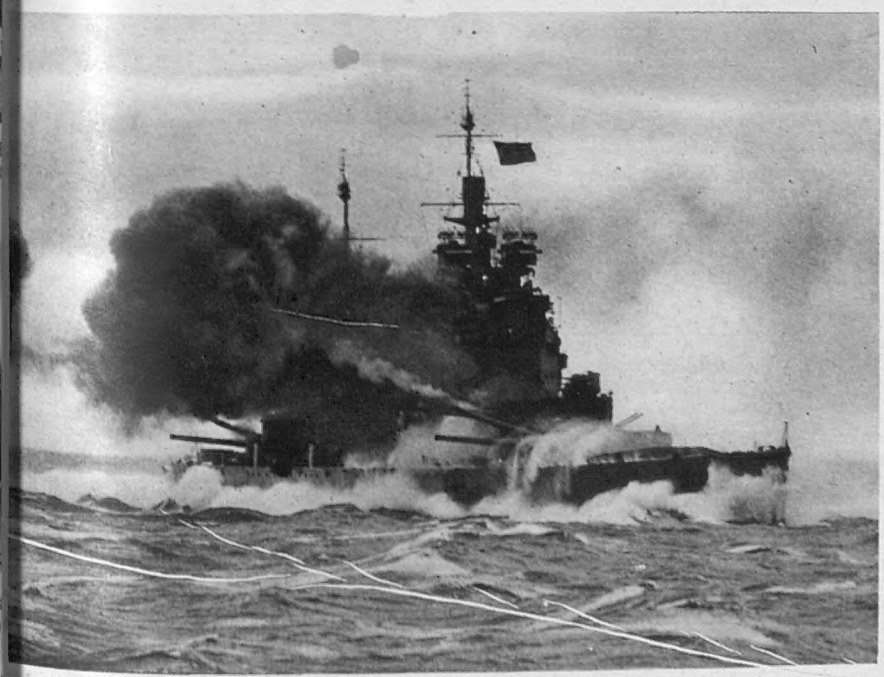
VANQUISHED: Admiral Otto Schneewind, Commander-in-Chief of the German Naval Forces in Northern Waters. He and all his staff are believed to have gone down with the "Scharnhorst." He left the "Tirpitz" only three weeks ago

reporting her position to the *Duke of York*, who was moving up from the south-west to intercept. By this time darkness had closed in and the *Scharnhorst*, continuing at maximum speed, held to her southerly course until at about 4·15 p.m. the *Duke of York* made contact with her.

There was a danger that the *Scharnhorst's* superior speed might allow her to draw away from Admiral Fraser's flagship. The destroyers *Savage*, *Saumarez*, *Scorpion* and the Norwegian *Stord*, which had been steaming at full speed to get ahead of the enemy, turned in and, practically unsupported, attacked with torpedoes. The *Scharnhorst* was hit, probably by three torpedoes, in this attack, which reduced her speed and enabled the *Duke of York* to close the range and engage again. Shortly afterwards, the *Scharnhorst* was seen on fire and lying nearly stopped. The cruiser *Jamaica* delivered a final torpedo attack, after which the *Scharnhorst* sank at 7.45 p.m. in a position about 60 miles north-east of the North Cape.



THE GERMAN BATTLESHIP "SCHARNHORST" firing a salute on Hitler's birthday in a port whose identity was not revealed. This vessel was a sister-ship to *Gneisenau*. (The two were known throughout the Royal Navy as "Salmon and Gluckstein.") She had a standard displacement of 26,000 tons and carried a complement of 1,460. Her principal armament consisted of nine 11-in. guns, but she also had twelve 5·9-in. and fourteen 4·1-in. weapons. Her designed speed was 27 knots, but she was known to be much faster



ONE OF THE BIGGEST VESSELS IN THE ROYAL NAVY: The 35,000-ton battleship "Duke of York" firing her 14-in. guns whilst heavy seas break over her bows. The *Duke of York* is one of Britain's latest 35,000-ton battleships. She was built and engined by John Brown's of Clydebank and completed in 1941. Heavily armoured, she carries ten 14-in. guns and has a powerful secondary armament and numerous smaller weapons. She also carries four aircraft and has a peacetime complement of approximately 1,500 men

A FULL CALIBRE FIRING FROM THE SECONDARY ARMAMENT of the "Duke of York," flagship of Admiral Sir Bruce Fraser during the "Scharnhorst" action off North Cape

THE RIDDLE OF POST-WAR AIR TRAVEL

Will Air Expansion Come as Rapidly as Some Believe? Will there be a Big Demand for this Form of Travel? By FERDINAND TUOHY

HOW much will the public want to use the air after the war? I doubt if one could find a question to which such widely divergent answers are given. One is launched upon a sky of speculation, of assertion and counter-assertion.

To listen to some, the post-war generation is going to leap into the skies. "Look," you are told, "how they are all trying to get into the Air Force. That shows." Others, not necessarily older people, doubt if journeying by land and sea will be much more than lightly impinged upon. Air travel, by such way of thinking, will be a valued but small, accessory means of transport. It will expand, but to nothing like the extent one hears.

Some support to the latter line of argument is supplied by what happened after the last war. The first real use of the air outside military operations was made in connection with the Paris Peace Conference during which hundreds must have flown on missions in one direction or another. I recollect subsequent enthusiastic day-dreams in a restaurant near the Porte St. Denis, frequented by the late Captain Barnard, original Instone pilot.

Eighteen months after the Armistice, Barnard was not discouraged by an almost total absence of mail, freight, and passengers—so much so, that he would jam me into his open cockpit, gratis, en route for London—at the time he was engaged on the first aerial enterprise involving production of a newspaper. "The public will come along," he would say, "as soon as we get the buses. Can't expect 'em to take to a converted B.E.2.C."

One is forced to admit that these dreams never came anywhere near to being realised, and that the explanation was not lack of safe and, in reason, comfortable aircraft. Great pioneer work was done in the way of laying out air routes; magnificent round-the-world flights revealed the realms that aircraft had conquered; yet it is futile to assert that more than a very tiny and specialising proportion of the travelling public came to think in terms of air travel to the exclusion of funnels and tunnels.

Spectacular personages, public and business men, overseas officials and their families, newspaper correspondents, film and other stars, and a fragment of the high-stepping cosmopolitan world, composed the "regulars" of air travel down to 1939. Here, at home, when was there a rush for seats in aircraft, save Paris-bound, at Easter and August Bank Holiday, on the last of which, some hundreds were left behind at Croydon and other airports? *Hundreds.* I chanced to be at a fair in Essex at that period, when not more than twenty took baptism flights each day, at five shillings a time.

This lack of public response to the air had a mixture of reasons. The high cost of a real journey. The hours lost in getting to and from airfields. Nervousness at making the first flight. Tales of air sickness. The crush. Fondness for the more leisurely and interesting train-cum-ship.

Even in the United States, where air travel had far outstripped the volume of civil flying elsewhere, domestic requirements at the beginning of this war did not exceed 350 aeroplanes. That seems to be something to reflect upon. Thousands of civilians criss-crossed the forty-eight States every twenty-four hours, and all they needed in the way of machines was 350 or a few days' output from a couple of the bigger contemporary aircraft factories.

In the House of Lords recently, an estimate was put forward, which gave America's post-war requirements for domestic use as 5,500, while no sooner had this figure been advanced, than expert voices across the Atlantic blithely doubled the London assessment. Apart altogether from overseas calls, the Americans would require more than 10,000 aeroplanes for domestic use, when they had required but 350 aircraft for like purposes at the outset of war. By what process of reasoning do these American experts arrive at the conclusion that the public will want to make thirty times greater use of the air in the '40's than it did in the '30's? I confess it beats me. That there will be a notable increase in passenger travel, is certain. But there may be a great deal more accuracy in the reserve expressed by an Orville Wright. Wright pooh-poohs the idea that planes will presently supplant trains, ships, lorries, and cars. He sees an interval of, maybe, the best part of a decade before the aeroplane comes into a new form of popular usage. At first, it will not be able to compete with ships and trains in the matter of freight-carrying. There will be much more passenger service of all kinds. Across the Atlantic, it may be lower than first-class fares. As for privately-owned machines, Orville Wright sees nothing revolutionary in the way of an increase for years to come.

I pass to another expert view, bearing out the above. United Airlines of America considers that transatlantic air travel will be so relatively slight that by 1948 fewer than forty-eight aircraft, each holding one hundred passengers, will be adequate to receive the entire traffic. One single American airline could take care of the whole business, it is argued.

Then there is Mr. Kastner, spoken of as the first authority in America. Mr. Kastner thinks that America will be left with a great number of transport planes even after all domestic and foreign requirements have been met in the immediate post-war period. He frankly sees a threat to his country's air industry inasmuch as "only about 3,000 heavy aircraft may be needed for the whole world. . . . Sometimes it seems as if there were hardly room enough in the world's air for anybody but Americans."

To go to the other extreme, the Civil Aeronautics Administration, Government authority in Washington, forecasts all American requirements at 15,000 aeroplanes, which would include 4,000 heavies, or 1,000 more than the whole world needs, according to Mr. Kastner. Moreover, there will be a few others in the construction field besides British and Americans. The Russians, French, Dutch, Swiss and Scandinavians will wish to expand pre-war services, while there will undoubtedly be newcomers, such as Poles and Czechs, to take on traffic once borne by the extinguished Lufthansa and Italian lines.

The lay observer may well be forgiven if he foresees keen trouble ahead. Say that the war finishes with the Allies producing between 15,000 and 20,000 planes a month. Any number of these aircraft companies will wish to transfer to peace construction, bitten by the immense possibilities of the Air Age, as this has been dangled. But supposing that the Orville Wrights are correct and that a small proportion of the world's potential aircraft output will suffice to meet public demands? It is not difficult to picture the bitter fight that will ensue to get stakes in the small market available; nor the danger to international relations and world peace arising therefrom.

At the same time, underestimates of likely air travel in the future have to be guarded against, lest they be deliberately made to put us on a wrong course. Blueprints of planes take years on their way to fulfilment in the factory, and any serious miscalculation might be past retrieving. As a World Power, European Centre, and Empire Hub, Britain can obviously afford to play second to none in the air. But anything that can be done to bring facts and figures from the clouds down to earth, should be well worth the effort.

As a personal opinion, it does seem that if there is any one thing which calls for some form of international and State control, it is the air in our time; that the gamblers and pushers figuring as patriots, but more set on shares and power, should be held well in check from the start, held down to reason—and that, for all our sakes.

Meanwhile, it is less enervating to turn to the views of a Perrin and a Brabazon. The Commander wants arrangements made in advance "to meet the big demand that is certain to spring up after the war for flights to Germany, France, and other European countries by private owners." Many firms, it appears, plan to have their own "chauffeur-driven" planes for their business representatives. That the Continent will be no place for land travel for a considerable period after the cease-fire, is a foregone conclusion. Aside from an immense amount of official flying on peacemaking affairs, private flying on business of all kinds is a certainty.

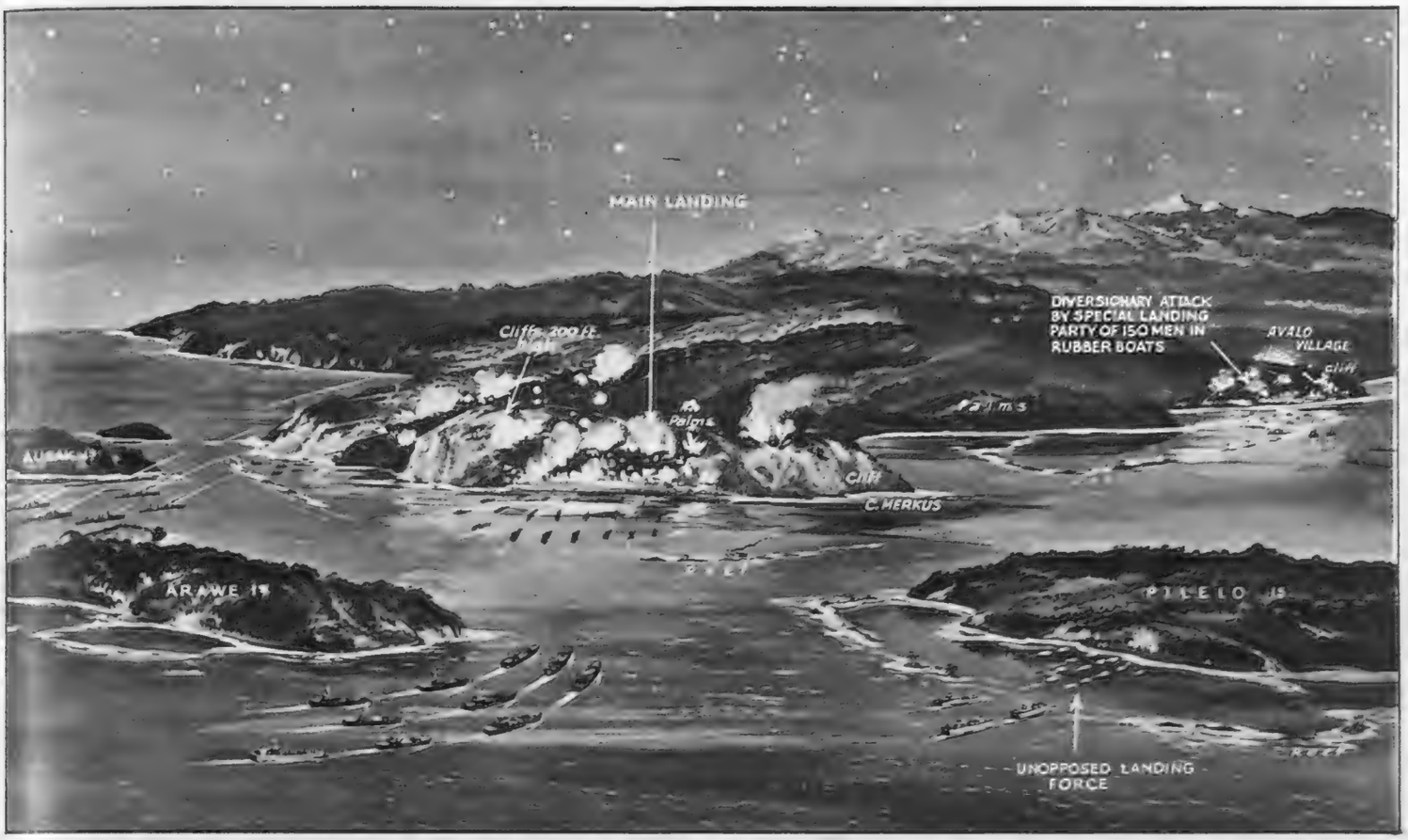
Lord Brabazon, for his part, talks of £150 midget runabouts, capable of being kept up on £1 a week. So many thousands—tens of thousands—will have had air experience through the war, that the temptation will be great to buy a runabout instead of a car. Will it? There the whole question of the enjoyment to be derived from air travel comes up for consideration. I asked three of the new generation their views and it boiled down to this:

"I shan't want to fly except to get a good way into the country on occasional week-ends, and to get quickly to the Mediterranean or Switzerland in summer and winter. If one has only a fortnight's holiday, it will be great to be able to get to Riviera sun or to Swiss winter sports in an afternoon instead of crowding into trains and boats that may keep you on the journey anything up to thirty-six hours. As for having an "air-about" to use as one has had a car, the one thing that would send me up would be the overcrowded state of the roads. I prefer the roads, and the sea also, except when in a first-class hurry."

There is this further snag in the runabout idea. A leading firm says it would not be practical to build cheap aircraft unless a regular sale of 10,000 a year were guaranteed. Not more than a few score flew privately and regularly in this country before the war. Again one is confronted by the question: On what grounds are based these forecasts of colossal expansion?

TWO STEWARDESSES OF BRITISH OVERSEAS AIRWAYS in the stern of a launch as it goes out to a waiting flying-boat in the harbour. These women are helping the Merchant air service to-day in much the same manner as the W.A.A.F. are helping the R.A.F. They wear a smart dark-blue uniform, with a rose-coloured band round the sleeve, and a jaunty dark-blue forage cap. Their job is to look after the comfort of the passengers, who have to make long flying trips on urgent official business. This new profession has only recently been created; it opens an entirely new career for British women. At present the work of an air stewardess is hard and her travels limited, but after the war she will undoubtedly work on the transatlantic services as well as on those to all the European countries

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this publication should not be taken as an indication that they are necessarily available for export



WHERE THE AMERICAN LANDINGS ON THE ISLAND OF NEW BRITAIN WERE MADE. The main attack was launched at Cape Merkus, between Gasmata and Gloucester, on a beach near 200-ft.-high cliffs, but a diversionary attack was also staged at Avalo Village by a party of 150 men in rubber boats; at the same time, a landing was also effected on Pilelo Island, and this spot was occupied by the American forces with no opposition from the Japs—*Drawing by E. G. Lambert*

The AMERICAN INVASION of NEW BRITAIN

The Pacific Island which Contains the Big Japanese Bases of Rabaul and Gasmata

—Special Sphere Drawings and Diagrams

The invasion of New Britain, southern bastion of the Japanese in the Pacific, was launched by the Americans at dawn on December 15. The landing took place at a point on the south-western shore, at a considerable distance from Gasmata (the important Japanese base which is second only to Rabaul) and between Gasmata and Cape Gloucester. It would appear that the landings already effected have no immediate relation to the eventual capture of the naval port of Rabaul, far away to the north-east.

The number of places at which landings can be effected on New Britain is limited, as its coasts are frequently precipitous. At Cape Merkus, however, the cliff-line is broken by palm-fringed beaches, with submerged coral reefs partially fringing the coast. As shown in the large map below, a mountain ridge traverses the length of the island, its greatest height being about 6,500 ft. The whole of New Britain is covered with dense tropical vegetation; towards the north-east, in the Rabaul area, it has been described as particulariy poisonous. Several streams of considerable volume water the island.

Three Japanese airfields have been referred to from time to time as having received attention from Allied bombers before the actual landings took place. One is at Gasmata, another at Cape Gloucester, and a third near Arawe. The last-mentioned was quickly in American hands. The south-westerly portion of New Britain approaches the Huon Peninsula of New Guinea, where other Allied operations have been taking place from the recently captured Finschafen base.

THE ISLAND OF NEW BRITAIN IN DETAIL, SHOWING THE THREE MAIN POINTS OF JAPANESE STRENGTH. Rabaul at the north-easterly tip is the principal Jap base in the South-West Pacific; Gasmata is the island's second base; and there is a third at Cape Gloucester. All three are furnished with airfields. The place at which the first American troops landed in strength is Cape Merkus, near Arawe. To the south-west, the island of New Britain approaches the harbour of Finschafen, in New Guinea, recently wrested from the Japs by American and Australian forces

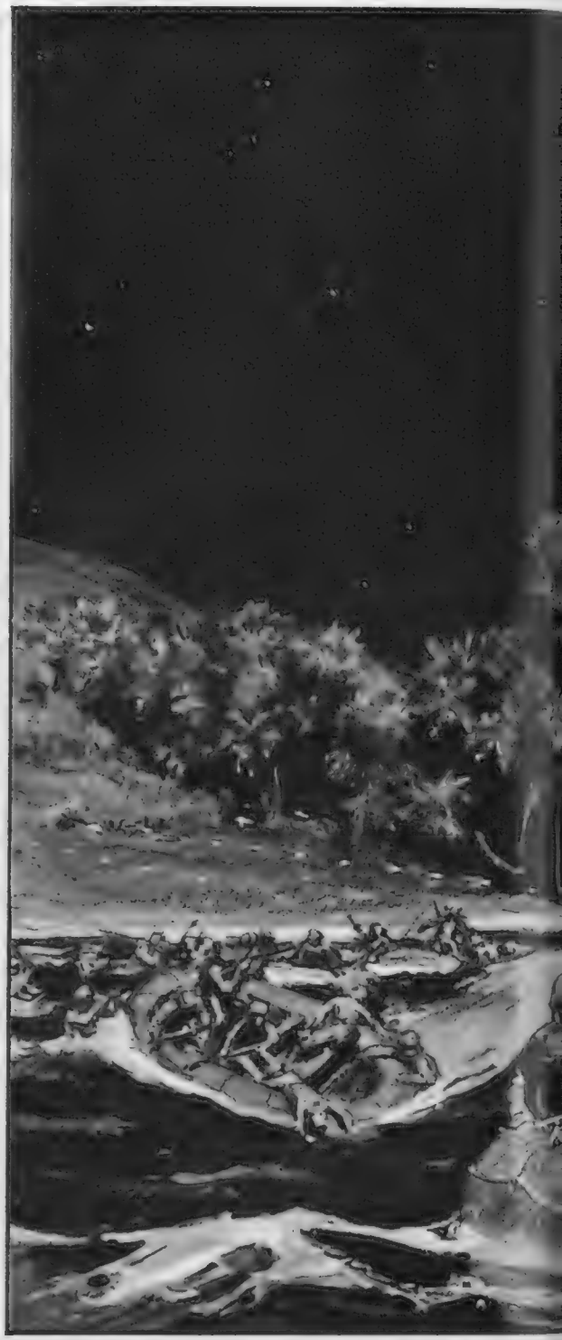
LANDING on the ISLAND of NEW BRITAIN

How the Attacks at Cape Merkus and the Diversionary Attack at Avalo were Carried Out by American Commando Troops

—Special Sphere Drawings of Incidents During the Invasion

A JAPANESE DIVE-BOMBER IS SHOT DOWN OVER THE ARAWE PENINSULA—*Drawing by Roland Davies*

It was not long after the initial landings that the whole of the Arawe Peninsula was cleared of Japs: thereafter attacks by their aircraft were carried out on the American land forces, but with little effect, three of them being shot down out of the comparatively small number the enemy were able to send into action. The aircraft shown in this drawing, half-buried in the dense tropic vegetation, is a naval type—the Aichi 99: this is a single-engined dive-bomber land plane: it carries a crew of two, and it is armed with two fixed forward-firing guns and one or two flexible rear guns in the after cockpit



Below—**HOW THE LANDING AT CAPE MERKUS WAS EFFECTED: American amphibious tanks leaving the landing craft and going forward to the New Britain beaches**—*Drawing by Wm. McDowell*

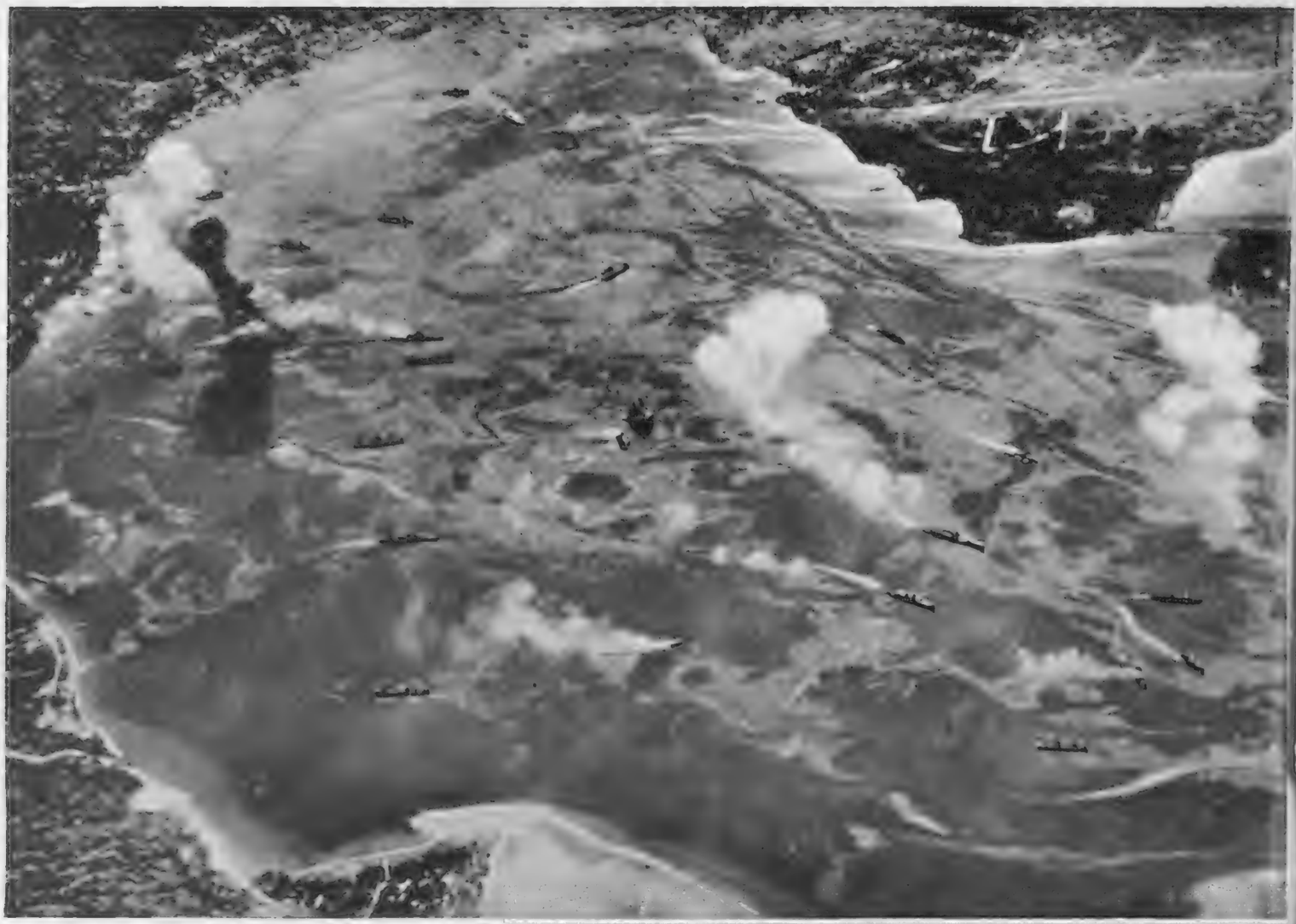
The main assault was carried out by troops in amphibious armoured vehicles and assault barges. The bulk of the soldiers taking part had previously been disembarked from the big transports into Buffaloes, Alligators, and other small craft. The Alligator is an amphibious vehicle which had been used by the Americans in the Solomons operations; the Buffalo is a larger and improved version of the same vehicle which had never before been used. Both are propelled through the water by the same rubberised track which enables them to be used on land. These craft headed for the narrow channel between Cape Merkus and Pilelo Island, just south of the cape, and after the heavy naval bombardment by U.S. warships, they carried out the main landing on a small beach on the western side of Cape Merkus

AN HEROIC EFFORT BY AMERICAN COMMANDO TROOPS. THE DIVERSIONARY ATTEMPT TOWARDS AVALO VILLAGE whilst the real landing was proceeding at Cape Merkus. Only seventy-five men returned out of the one hundred and fifty-five who set out, and it is thought that only one man actually set foot on the beach. As the Americans went ashore, the Japs fired from the cliffs and from lower ground on the left, enfilading the approaches to the beach: the survivors had to clamber back into their rubber boats and return through the surf—*Drawing by Edward Osmond*

While the main American forces were preparing for the real landing at Cape Merkus, a body of Commando troops were sent in to strike a diversionary blow near the village of Avalo, to the east of Merkus. A body of 155 men set off in rubber boats: half of them never got back, and it is thought that only one actually set foot on the beach. As the Commandos went in, withering cross-fire from the Japs up on the cliffs and on the beaches met them. They fought, waist deep in the surf, with the Japanese machine-gunners raking the sea with bullets. Some of them were up to their necks, struggling to fire their tommy guns and rifles as they fought desperately to reach the shore. The survivors swam back to sea and were picked up in rubber boats.

The attack was made by night, and before the general bombardment which preceded the real landings had opened. "In the moonlight, Japanese machine-gun fire suddenly opened up from the beach," said the leader of the Commandos. "The Japanese gunners screeched and yelled. Our men continued to approach for fifteen minutes, but the odds were impossible. The men were ordered to get back into the boats." There were only five of the latter now left: seventy-five men returned to the starting-point out of the 155 which left. These were, however, the principal casualties sustained by the Americans during the whole of the invasion operation.

JAP AIRCRAFT VERSUS AMERICAN WARSHIP: Three Jap torpedo-planes burn fiercely just ahead of the destroyer in the centre of the picture after being shot down during the naval operations preceding the New Britain landings. The destroyer was part of a Task Force in the Pacific: at the same moment as this picture was taken, American planes from the Task Force were attacking the great Japanese base at Rabaul on New Britain Island



War in the Pacific

The JAP BASE at RABAUL

On the Island of New Britain, during an Attack from the Air by American Bombers

THE AMERICANS CARRY OUT A "PEARL HARBOUR" ATTACK ON THE GREAT JAPANESE BASE AT RABAUL. Avenger torpedo-bombers and Dauntless dive-bombers play havoc with enemy shipping in the New Britain harbour: a picture, taken on November 5, showing torpedoes smashing into five heavy cruisers and a light cruiser, whilst another warship is hit by bombs. Other units of the Jap Fleet are seen to be scurrying to the open sea in an attempt to evade the attackers

BURNING AND SINKING UNDER HEAVY BOMBING AT RABAUL, four Jap warships send up clouds of smoke which nearly obscure the devastation caused at the same time by bombs on the waterfront installations. The photograph was made from one of the raiding bombers flying at very close range to the guns of the Jap heavy cruiser in the foreground, which is one of the 10,000-ton Nachi class, armed with ten 8-in. weapons

Rabaul is the most important of the Japanese bases in the whole South-Western Pacific. To-day, American troops are within 270 miles of this key point by reason of the New Britain landings. Early in November it was reported that nineteen Japanese warships were in the harbour—five heavy cruisers, three light cruisers, five destroyers, two corvettes and lighter craft. Consequently, Rabaul was very heavily bombed by two waves of American aircraft operating in great strength. In the first attack, naval dive-bombers, torpedo-bombers and fighters swooped on the Japanese vessels, scoring hits with bombs and torpedoes on all the heavy cruisers (one of which blew up) and two light cruisers and shooting down twenty-four out of seventy Japanese fighters (with another twenty-two "probables"). Soon afterwards, U.S. bombers with fighter escorts dropped 82 tons of bombs, causing great explosions and fires. Rabaul has now suffered many such attacks from the air—a sort of "Pearl Harbour" in reverse!

ON NOVEMBER 5 IN RABAUL HARBOUR: A heavy Japanese cruiser suffers a direct hit amidships as U.S. Navy dive-bombers and torpedo-planes wreaked havoc amongst the Jap concentrations at the great enemy naval base

WHAT HAPPENS TO JAP SHIPPING IN THE PACIFIC. A merchantman under attack by an American Liberator bomber: the vessel sank later as the result of direct hits

THE CIVIL POPULATION IN ITALY UNDER ALLIED GOVERNMENT

THE NAVY RESCUES REFUGEES IN ITALY. Surrounded by their remaining belongings, these women are waiting on the quay for transport to their villages after a voyage in a British ship. Among the many war jobs of H.M. ships operating in Italian waters are humanitarian duties, such as that of transporting hundreds of civilians back to their nearest home port after they had been driven from their homes during the German retreat. As they find their way to our advancing lines, these refugees—some of them Dalmatian settlers—are fed and looked after. Women with babies in their arms, men and small children travel homewards in naval vessels which not long since carried Allied troops for the invasion of Italy

THE NAPLES POST-OFFICE RESUMES OPERATIONS: Civilians at the counters where work has now been resumed. Limited postal services in Naples were recently re-established under the direction of A.M.G. and the Italian Government, utilising the General Post-Office which was time-bombed by the Nazis. The payment of old-age and invalid pensions, and other liabilities, have all now been resumed. Two thousand one hundred employees of the Naples post-office are back at work to cope with such things

ITALIAN REFUGEES CARED FOR BY THE ALLIED FORCES. Some of the little victims of war brought back from the front to Naples, where they will now be looked after and fed by A.M.G. On the right is Captain Oliver D. Comstock, of the U.S. Army. The Germans are forcing numbers of the Italian civil population towards the Allied forward lines, to impede our troop movements in these areas—an old trick which they adopted in France and Belgium!

IN THE STREETS OF CASTEL DI SANGRO: Women among the ruins of their homes, spreading wheat they have salvaged to dry in the sun. This town was completely destroyed by the Germans before they were driven out, only twelve houses now remaining intact—and that only owing to the failure of the explosives to detonate. In the background can be seen some of the ruined houses

MOTHER AND DAUGHTER waiting patiently in the biting cold for Canadian transportation to another town in Italy after their own—San Pietro—had been destroyed by the retreating Germans. Note the framework of gutted buildings in the background

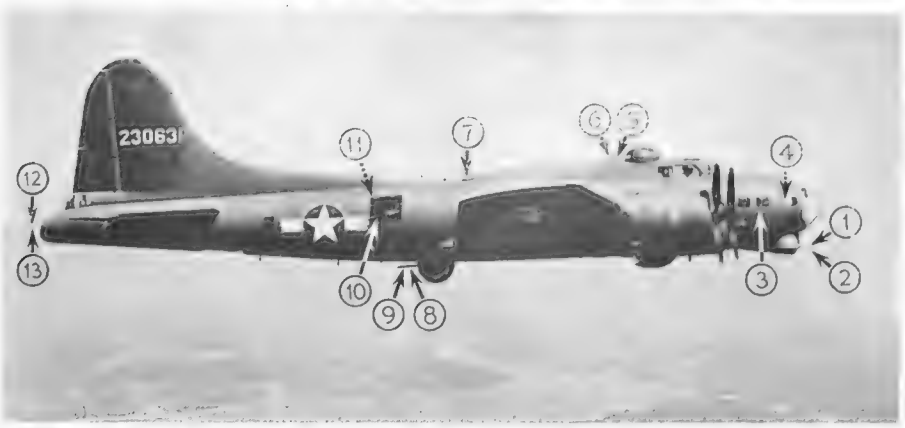
FRONT-LINE C.M.P.s IN ITALY: Inspecting the passes of Italian civilians in the main street of Lanciano: The front line Military Police have a vital and dangerous job, directing traffic and giving information to those who need it in every town and village that falls into Allied hands. In most cases, they work under constant shell-fire, and always in danger from mines and hidden snipers. They put up direction notices and marking boards, so that the Army can get to the front in the shortest possible time

BOMBING THROUGH CLOUD

And Official Pictures of the Damage done to Leipzig during the Raid on December 4, 1943

THE NEW AMERICAN METHOD OF DAYLIGHT BOMBING THROUGH CLOUD : A close-up of three Flying Fortresses with bomb doors open and the first bombs beginning their plunge earthwards during the Wilhelmshaven attack on November 3

TAKEN DURING AN AMERICAN ATTACK ON THE IMPORTANT GERMAN PORT OF EMDEN on October 2. In the foreground two sticks of bombs just begin to nose downward as they enter the solid cloud-bank over the target

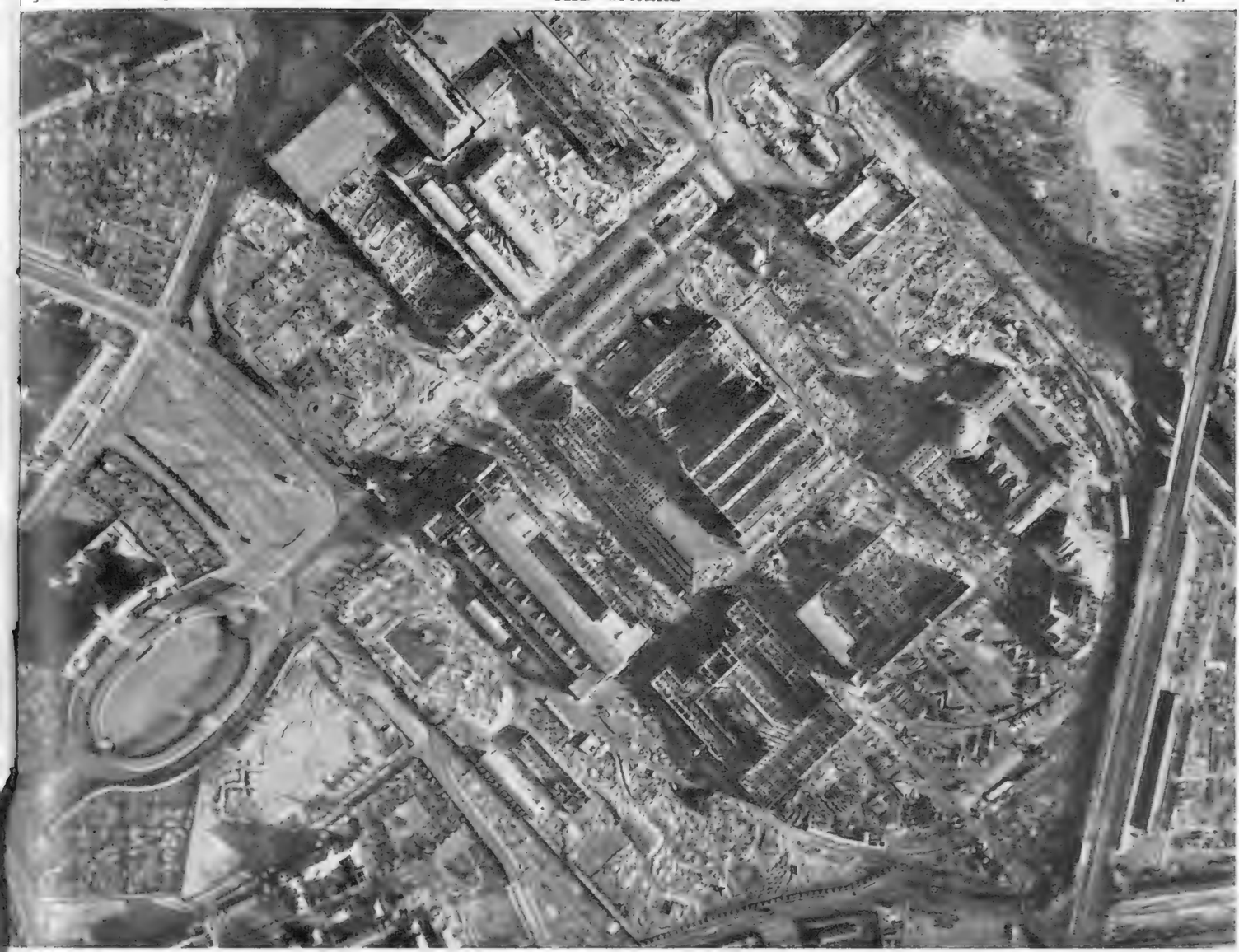


A FLYING ARSENAL : Why the Flying Fortress is such a powerful opponent of the German fighter aircraft. Here, for the first time the fire-power of one of the big American bombers is shown in completeness It is armed with no fewer than thirteen ·50-calibre machine-guns disposed in the manner indicated above. Nos. 1 and 2 are in the new deadly "chin turret"; Nos. 3 and 4 are normally operated by Navigator and Bombardier to fight off frontal attacks and supplement the guns in the "chin turret"; Nos. 5 and 6 are handled by the First Engineer in the power-turret, to take care of lateral and rear attacks; No. 7 is operated by the First Radio Operator amidships, against any threat from above; Nos. 8 and 9 are fired by the Second Radio Operator in the "ball turret" below the aircraft; Nos. 10 and 11 are in the "waist" and are fired by the Second Engineer and the First Radio Operator, against lateral attack; and Nos. 12 and 13 are used by the photographer and tail gunner to fight off attacks from the rear

WITH NO CLEAR VIEW OF THE GROUND BENEATH, the bombs are released over the target at Wilhelmshaven. The results are shown below

AFTER AN ATTACK ON WILHELMSHAVEN DURING HEAVY CLOUD. A reconnaissance view of a section of the U-boat construction yard in Barhafen area. A number of buildings are damaged, including the lathe shop and joiner shops, which were gutted, and a machine shop, which was severely damaged

The development of a new bombing technique has just been announced by U.S. Eighth Air Force. Their Bomber Command, employing the latest scientific devices, are now able to operate by daylight on targets the pilot cannot actually see, when the cloud cover is solid, or "10-10ths," as airmen call it. The announcement of this new technique was withheld until actual operational tests proved its success. Whilst the accuracy of the new method is not equal to that usually attained by high-altitude "precision" bombing when the target is visible, the accuracy attained is considered to be satisfactory. It is a logical outgrowth of American bombardment doctrine, and it does not involve any basic change in the American conception of bombing. The new method has been used on missions involving over 5,000 bombers : included were tremendous attacks on Kiel and Wilhelmshaven. The results are not known until several days later when visibility permits of photographic reconnaissance. The pictures reproduced above illustrate the new technique, and the results achieved at Wilhelmshaven



AN OFFICIAL AIR MINISTRY PHOTOGRAPH TAKEN AFTER THE LEIPZIG ATTACK : Very severe damage was caused among the buildings on the site of the famous World's Fair : many of them have been completely devastated, and most of the others are little more than heaps of burned and blasted wreckage

THE BOMBING OF LEIPZIG

The Results of the Big Raid carried out by the R.A.F. on December 4, 1943

Just over a month ago, in the early hours of the morning on December 4, a heavy attack was made by the R.A.F. on the very important German city of Leipzig. Photographic reconnaissance has now brought conclusive proof of the shattering effect of the raid, when 1,500 tons of high explosive were showered down on the many industrial targets below.

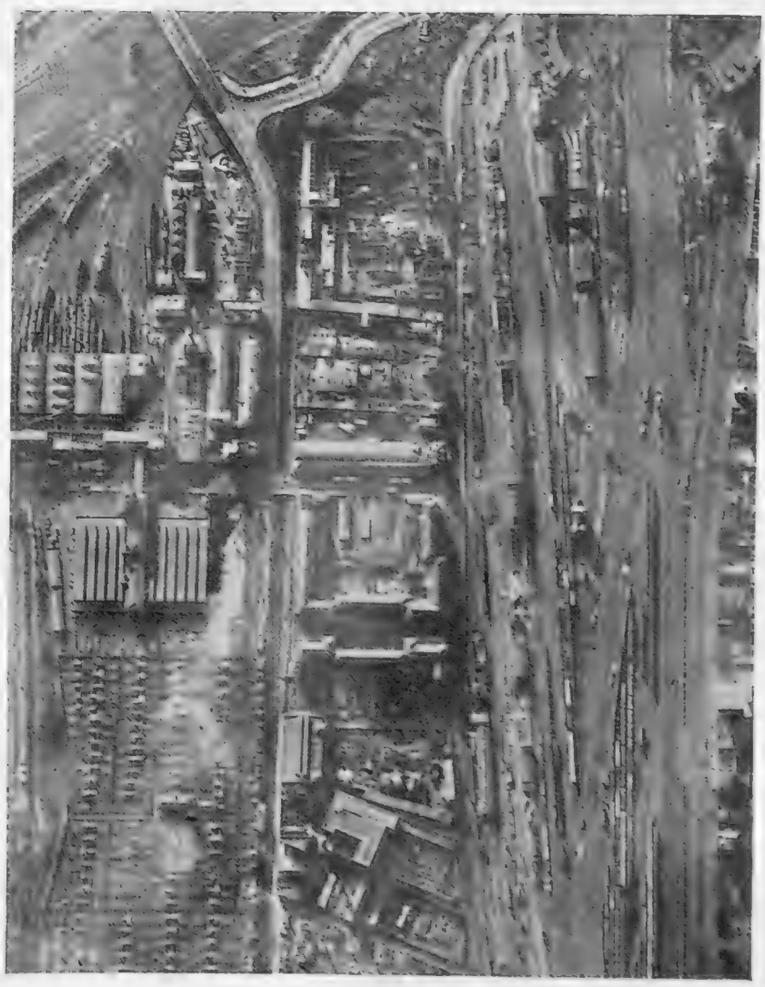
The first attempts to secure photographs were hampered because the city was almost completely hidden under the dense smoke-pall from the fires started by the Lancasters and Halifaxes which took part in the attack.

Before December 4, Leipzig was the fifth largest city in Germany, and it was comparable with Berlin and Hamburg in industrial importance : it had only once before been heavily hit by the R.A.F Thick cloud covered the city when the heavy bombers arrived ; yet, so accurately had the Pathfinders placed their target-indicator flares, that many targets of high priority are now known to have been hit.

The great buildings which, in pre-war years, housed Leipzig's famous Trade Fairs had been turned over to the assembly and repair of aircraft. Practically every one of the hundred or so acres covered by the Fair site have been severely damaged—many of them have been, literally, wiped out

SION ACCOMPLISHED—and aircraft brought home. This battered Flying Fortress came back from Bremen to land in England : HO had half its stabiliser shorn off, its udder smashed beyond use, one engine ad, and five gun positions knocked out of action

On right—In this stretch of heavily damaged industrial buildings in Leipzig are the works of Thuringer Wollgarspinnerei (wool yarn spinners) ; Emil Kollner (asphalte and roofing felt) ; A.B.C. Baumaschinen Fabrik Schuman and Co. (building machinery) ; Rothenstein Accumulatoren A.G. (accumulators) ; I.G.F.I. A.G. Sauerstoff Werk Vereinigte Sauer Stoffewerke G.M.B.H. (oxygen)

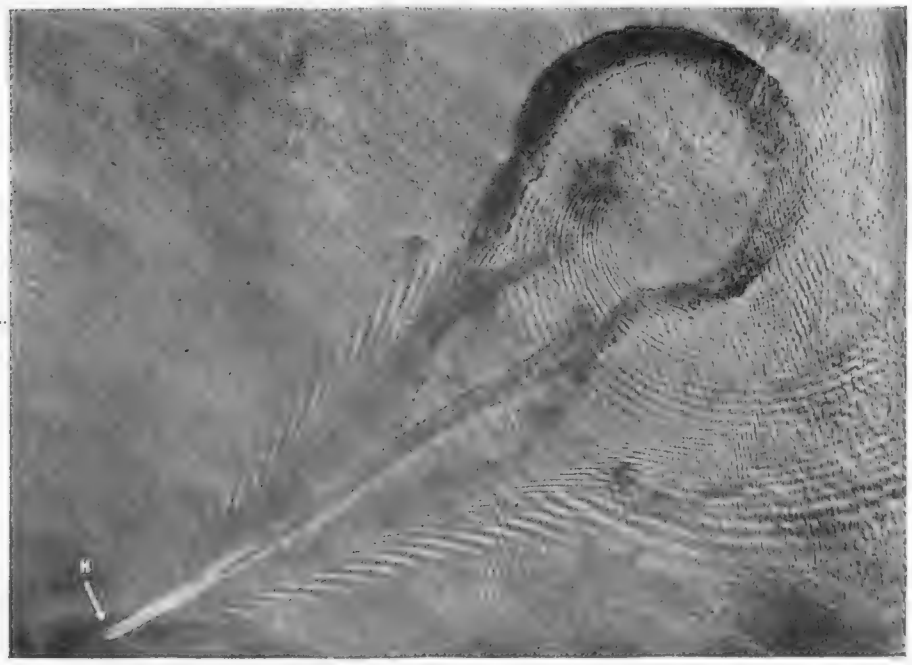


SUBMARINES and AIRCRAFT at SEA

A Strange Mediterranean Rescue by Submarine ; and Aerial Pictures of a Naval and Air Combat in the Straits of Messina

SURFACE-PATTERN PICTURES TELL THE STORY OF A BRITISH SUBMARINE SUCCESS IN THE STRAITS OF MESSINA (see notes in box below, on right) : 1. The course of an enemy ship is apparent at **A.** A second track (**B-C**) crosses the first and there is an explosion at this point, **D.** This second track was presumed to have been made by torpedoes from one of our own submarines. When the submarine's crew's report was received, this was proved to be correct. Torpedoes hit the Italian ship and caused the explosion at **D,** whilst others missed the target and continued on the track **C.** After the explosion the Italian ship continued in a circle and finally blew up

2. AN ENEMY SHIP, E, WITH HER BACK BROKEN, enveloped in steam and smoke and sinking after a torpedo attack. On this photograph a Cant Z 506b. aircraft (F) is seen. This plane made an attack on the submarine and dropped depth-charges at the point marked G on the upper photograph, close to where the torpedo tracks start



RESCUED OFF THE AMERICAN COAST : These Coast Guards formed part of the crew of the U.S. patrol vessel *Wilcox*, which was lost in a storm. After their ship had gone down, the men spent seventeen hours on life rafts amongst big waves and heavy seas. Here they are awaiting their turn to be taken aboard a rescue ship. Only one man was lost : he was swept off the ship's decks just before she foundered.

In mid-June 1943, a reconnaissance Spitfire of the R.A.F. took photographs of a naval and aerial combat in the Straits of Messina. At that time, these photographs were the sole source of information available ; there were no other reports until later. From examination of the photographs, position and times calculated from shadows, and from the concentric circles round the various points of disturbance, photographic interpretation experts formed certain theories and drew certain conclusions. These were later proved to be almost exactly correct when the crew of the British submarine concerned in the engagement were able to make their report and tell how their torpedoes had destroyed an enemy vessel. The three photographs reproduced on the left show how the interpretation experts arrived at their conclusions

On left—**3. A TORPEDO-BOAT, H, WHICH WAS ESCORTING AN ENEMY VESSEL SUNK BY TORPEDOES,** and which was reported by the submarine crew to have dropped depth-charges. The tracks indicate that this escort vessel had made a violent and complete turn just before the Spitfire obtained this photograph

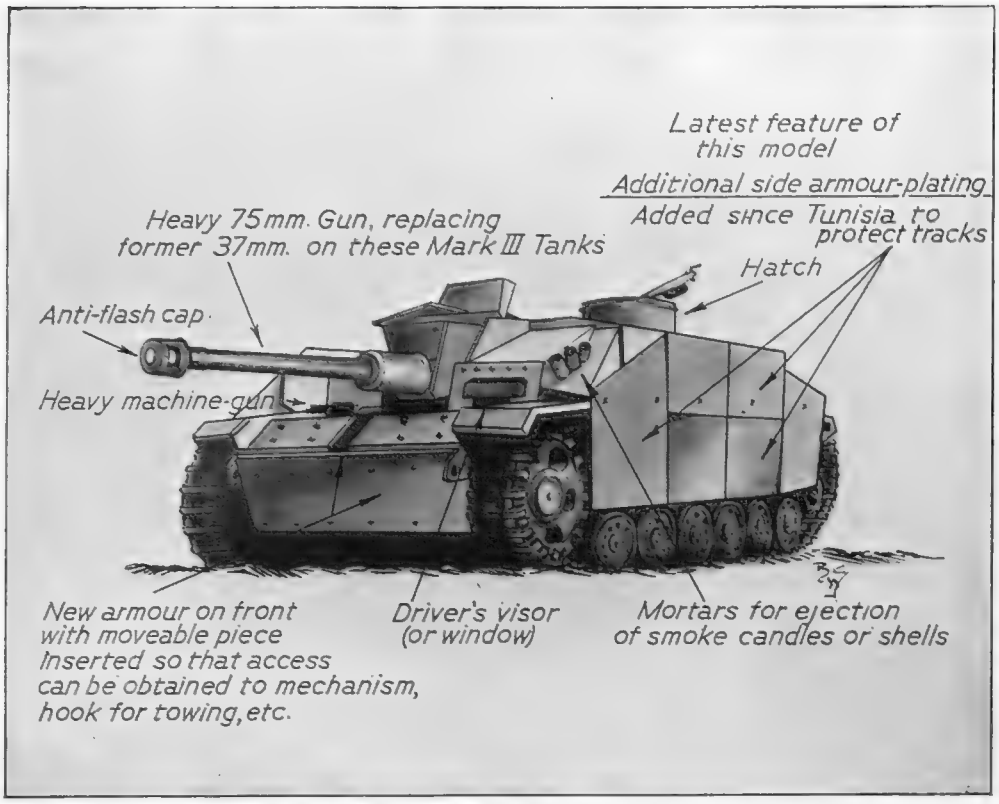
FROM THE HIGH HEAVENS TO THE DEPTHS OF THE SEA: A BRITISH SUBMARINE EMERGES FROM THE WATERS to take off pilot and navigator of a British aircraft shot down during operations over the Mediterranean—*Drawing by Montague Dawson*

One of the most startling moments in the career of Keith Eula Hopkins—Pilot Officer in the R.A.A.F. and serving in the Mediterranean—occurred recently during the course of operations in that theatre of war. Hopkins was the leader of a formation of aircraft in an attack on an enemy submarine: he had shot down an Arado seaplane when his own plane was hit by flak and brought down into the sea. Both Hopkins and his navigator—Keith Roget, who also comes from Melbourne—escaped in their rubber dinghy. They had been several hours on the water when, suddenly, the waves parted and a British submarine surfaced right alongside the dinghy. "I couldn't have been more surprised if Hitler had come down the chimney dressed as Santa Claus," said Hopkins later. The commanding officer of the submarine had seen the crew take to their rubber boat and had been waiting submerged until the coming of dusk made it safe for him to come to the rescue of the airmen. Hopkins has since been awarded the D.F.C.: the citation states that he has proved a determined pilot whose fine fighting spirit has been evident throughout his tour of operational flights. Once he took part in an attack on shipping in Naxos Harbour when, in the face of heavy anti-aircraft fire, the attack was pressed home with great vigour and two enemy vessels were set on fire

GERMAN AIRMEN BROUGHT DOWN OVER THE SEA ARE RESCUED BY A BRITISH SHIP. This Focke-Wulf aircraft was shot down recently during naval operations: the crew were rescued, just as the plane was on the point of sinking, by a boat from a British warship, and are now prisoners of war in our hands

NEW MECHANICAL DEVICES

Being Used on the World's Battlefields To-day



THE TYPE OF "IMPROVED" MARK III TANK which the Germans have been using largely in Italy. Its principal feature is the additional side armour-plating, added since Tunisia, to protect the tracks —*Drawing by B. C. Wood*

The mainstay of the German panzer divisions in Italy is the tank seen above—the "improved" Mark III. Belonging to what is known as the light-medium category, it is used for operations where mobility combined with heavy fire-power are essential, and it has featured in most of the tank-to-tank skirmishes that have occasionally enlivened the Italian fighting. But the Mark III has generally met its match in our tanks, particularly Shermans, and the picture on the right above shows that not even new guns and heavily reinforced armour have sufficed to save the German machines from the occasional humiliation of capture intact. This tank was one of several that fell into our hands after the Salerno battle. Observe the powerful 75-mm. gun and the thick armour plates in front, with the thinner new plating at the side. When we first met the Mark III in Libya, it had only a 37-mm. gun, and both side-tracks and front were exposed vulnerably. It was quite common to see the Germans draping spare tracks round the front in an effort to increase the armoured protection. Since then the additions have been made, but not to make the Mark III capable of out-fighting our equivalent models. It may be observed that the machine in reality does not look so large and formidable as the photograph (which, as is usual with tank photographs, was taken from the level) might appear to indicate

AN ACTUAL PHOTOGRAPH OF THE TANK shown in the drawing on the left. This "improved" Mark III was knocked out at Salerno, where the picture was taken. Its main armament is a powerful 75-mm. gun. The three projecting tubes to the left in front are mortars, which can be used either for smoke-shells or for mortar shells

A GERMAN MARK IV SPECIAL, knocked out south of Petacciato, on the coast road north of Termoli. Numerous "S" mines were found in and around the tank

The aura of invincibility that has surrounded German tanks for many people is dissipated by photographs such as these—and for two interesting reasons. First, a picture of this kind demonstrates how badly a tank can be damaged by a single raking shot of our anti-tank artillery. The track and most of the bogey-wheels have been entirely stripped away. A dozen or so of such vehicles counter-attacked the Eighth Army at Termoli and most were thus knocked out. Second, the tank in the picture is a Mark IV Special, which means that it is roughly equivalent in size, style and performance to our own improved General Grant. For the Germans to be using such "old-fashioned" models in the vital Italian fighting shows that their armoured strength is dwindling. Mark IV's would be vulnerable to all our latest tank and anti-tank guns, despite that their clean lines tend to give them an appearance of great armoured strength when the vehicles are photographed (rather too flatteringly) from ground-level. The lines of this tank are also given distinction by the svelte shape of the rotatable cupola, which houses a 75-mm. gun with barrel some 9 ft. long, designed primarily for anti-tank work and fired electrically. Few of the Tunisian Tigers have so far been encountered by our troops in Italy

A NEW LIP MICROPHONE for use on the actual battlefield during action. This tiny microphone is attached to the lip of its wearer by brackets and ear-loops: it is used with tiny earphones which fit under battle helmets or inside gas-masks or respirators. The operator here has his hand on the control-switch. When the apparatus is in use, all interference is excluded, so that ordinary conversation may be heard above the loudest disturbances—only the desired voice being retained. This means that a soldier can speak into the microphone while standing amidst the deafening noise of battle or in a thundering tank and yet be heard clearly. The device is known as the U.S Army Microphone Model T45

***On right*—The development of the Landing Craft:** This picture shows the latest model of the American Navy's large Tank Lighter — the L.C.T.(6). When its ramp is dropped firmly on the beach in the manner shown here, a 32-ton tank can drive up and into the vessel with ease. The craft is a complete naval unit in itself, capable of quite long voyages and of self-defence. In coming operations—especially in the Pacific—it is probable that much work will be found for this type of vessel

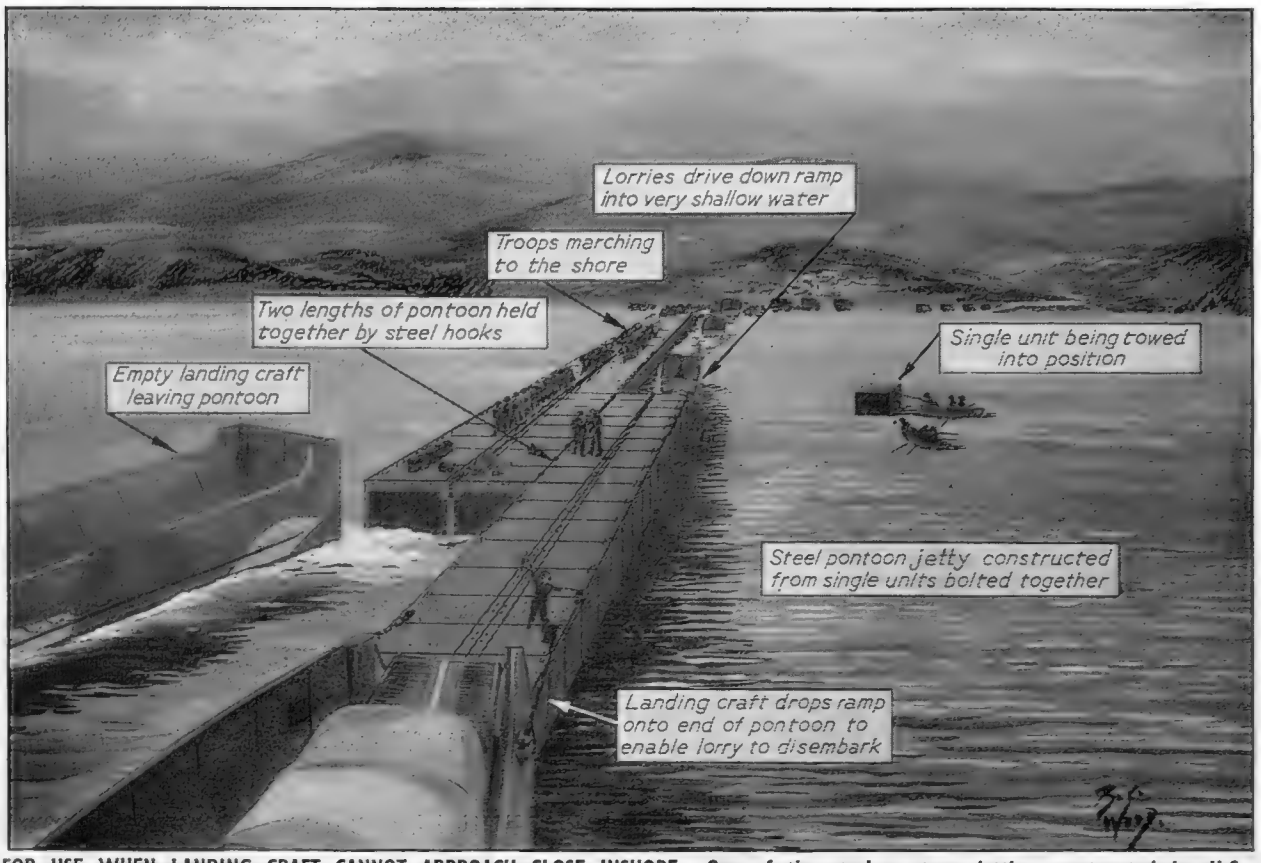
THE AMERICAN ARMY'S STEEL PONTOON JETTIES

The American Army in Italy have been making use of the special landing piers, or jetties, illustrated in three of the pictures reproduced here, these have been constructed at various points during the recent campaign at which landing operations have been in progress. The jetties consist of steel pontoons, which are added to one another from the beach outwards; short steel beams then effect the actual contact between jetty and bank. The separate pontoons are towed out during construction and joined up in pairs; they are then linked together until they form a projecting jetty.

When this has been completed to the desired length, an overlapping section of jetty is built up in the same fashion, and linked to the first portion constructed. This provides a convenient kind of open "dock," into which a landing barge can be towed and tied up to discharge its cargo. The pontoon units are linked together with steel plates, leaving a space of about 8 ins. between each pontoon unit. Steel loops are provided where the jetty is of double width in order that the pontoons may be hooked or joined together.

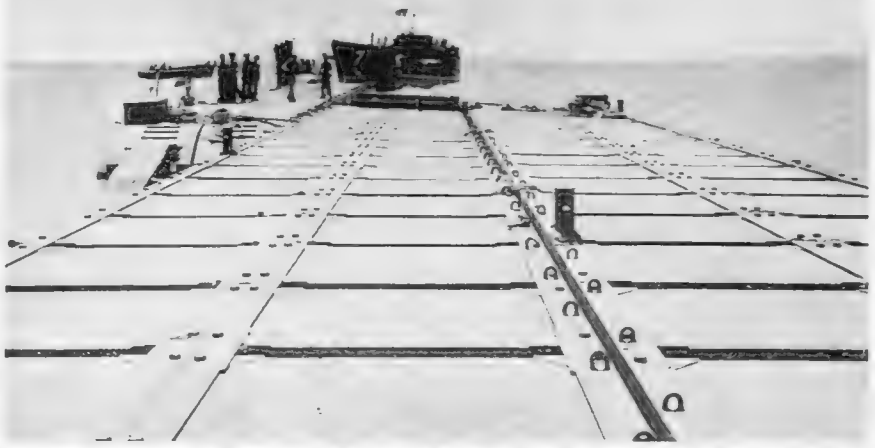
In the photograph given here only two loopings are shown. The space between each pontoon unit provides a certain flexibility to the whole jetty structure, permitting of the rise or fall of the water-level without putting too great a strain upon the structure as a whole. In the picture given immediately below the jetties are being made use of as soon as constructed and before any special roadway covering has been placed over the upper surfaces of the pontoons: but some such surface would obviously be necessary if heavy vehicles or tanks were landed upon them.

Owing to the watertight nature of the steel pontoons, the jetty has a high degree of buoyancy. The larger drawing at the top of the page indicates its manner of construction, and also the way in which landing craft can be brought up to discharge straight on the jetty. By the construction of these piers—which can be extended for some distance into the sea—landing operations and the bringing up of supplies can continue irrespective of the state of the tide. They should prove particularly valuable in the Pacific theatre of war.

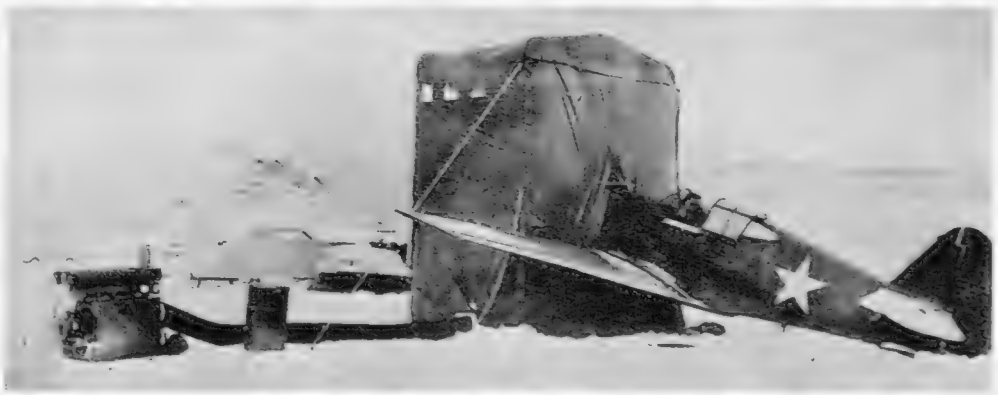


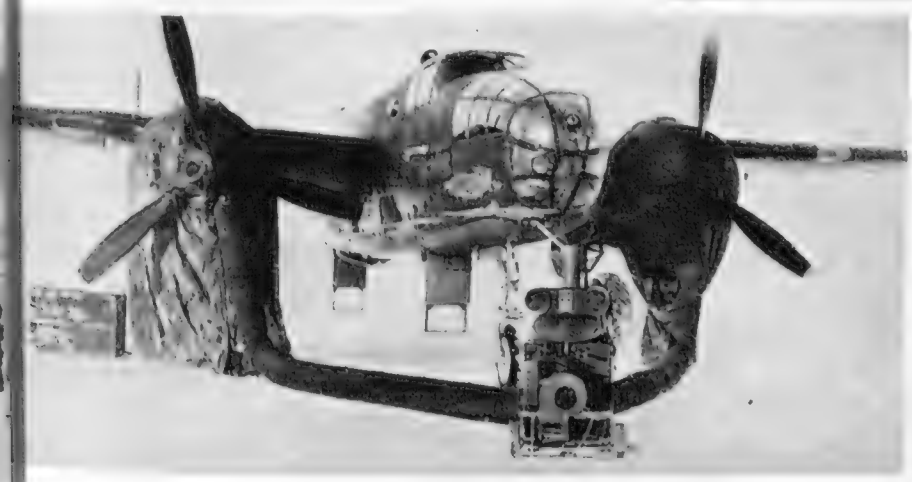
FOR USE WHEN LANDING CRAFT CANNOT APPROACH CLOSE INSHORE: One of the steel pontoon jetties constructed by U.S. Army engineers for the use of infantry along the Italian coast—*Drawing by B. C. Wood*

AN ACTUAL PHOTOGRAPH SHOWING A STEEL PONTOON JETTY in operation at Pesto, in Italy. It can be used for the disembarkation of troops and also of stores: when in place it forms a link between naval vessels and the shore, irrespective of the state of the tide. It is not unlikely that jetties of this type may prove highly valuable amongst the shallow waters and coral islands of the South-west Pacific



ANOTHER PHOTOGRAPH SHOWING A STEEL JETTY IN USE AT LICATA, IN SICILY—a view looking towards the sea. Note the links used in its construction





ABOVE AND ON THE LEFT—DE-ICING EQUIPMENT FOR LOW-TEMPERATURE FLYING: Ice is the enemy of every flying man: in certain theatres of war a knowledge of how to combat it is essential. The Russians won their last winter campaign largely through having better de-icing equipment and better low-temperature fuels than the Nazis on the frozen steppes which then formed the battleground. Their anti-freeze mehods successfully passed the test of battle and put victory within their grasp. In America and in Britain, much experimentation along the same lines has been made; tests have been, and are still being carried out to make men and machines as efficient as possible under the most trying Arctic or stratospheric conditions. Across the immense frozen prairies of Canada's great North-West and right up to the Alaskan wastes, the giant aircraft now fly during the very depths of winter. The two pictures reproduced here show how they are kept in flying trim. One of the results of American experimentation has been the production of a portable heating unit. This has been built for a dual purpose—a motor-driven fan blows hot air through the pipes into the engine, so that the latter will start up quickly without damage to its cylinders, or into the hut where the crew can shelter from the appalling external cold. In the two pictures given here, the heating unit is warming up a Mitchell B-25 bomber on an Alaskan airfield where the temperature is far below zero

GENERAL TITO and the PARTISANS in YUGOSLAVIA

The Story of the Great Anti-German Resistance Movement and its Implications throughout the Balkans Area

IN THE VERY TROUBLED BALKANS TO-DAY : In Serbia, the area held by the Germans is marked by shading—with three corridors extending to the coast at Split, Dubrovnik and Cattaro : the rest of the country is occupied by Partisans. In the south-east corner, the Bulgars have invaded Yugoslavia, and hope to hold what they have managed to filch. In Greece, there is trouble, too : two rival factions, operating against the Germans, are also operating against each other, despite appeals for a united front against the common enemy, the Nazis

IT has been confidently stated that the Partisan forces operating in Yugoslavia are occupying as many German divisions as those opposed to the Allied troops fighting in Italy. The number of these divisions vary from twelve to twenty-five, according to the information coming from the Free Yugoslav Radio operating from some place, not specified, in the liberated portion of Yugoslavia. Daily communiques are now issued from the headquarters of General Tito, the leader who has so skilfully commanded the Partisan troops for the past year. His identity, hidden hitherto, has just been revealed as General Josef Broz, a Croatian, born near Zagreb in 1892. Owing to his obstructionist methods, he was imprisoned in 1929 for six years by the Yugoslav Government, after which he took to underground revolutionary work, and so was fully prepared for carrying on guerilla warfare against the invaders of his country.

Ever since the capture of the port of Bari by the Allies, a regular supply of war material has been reaching the Partisans. Small fishing-vessels have convoyed guns, ammunition and food supplies, and have so replenished the forces under Tito that they have been carrying on active operations against the Germans. It is difficult to find out exactly which areas are held by the Partisans, as they owe their success against fully-trained armies to their power of rapid movement. The Germans hold all the ports on the Adriatic, but all the small islands along the shores, with the exception of those close to Fiume, are in the hands of the Partisans.

The Allied Air Force has been assisting Tito, attacking Zara, Split, Fiume and other strategic positions as they have been requested by General Tito. It is now known that Tito has two forces under his command, one which is formed as a regular army, with divisions, and equipped with up-to-date light weapons; and the other the guerilla body, which carries out orders to destroy communications, blow up bridges and then, after hiding their weapons, return to their civilian occupations. This latter force, operating everywhere, swells the numbers given as under Tito's command, which is said to be 250,000 men—the proportion belonging to the more regular force is not given. Evidently the guerillas do a large portion of the work.

While continuing the fighting against the enemy, Tito occupied the month of December in setting up a new Government for Yugoslavia. Delegates met at the small town of Jajce, in Bosnia, where they formed a council which has since been designated the National Committee for Liberation, which is to exercise full authority and have the character of a national Government. Full recognition is asked from the Allies for this Government, which would mean the throwing-over of King Peter and his Government at Cairo hitherto acknowledged by the Allies. The demands of the National Committee of Liberation, which gave General Tito the title of Marshal, grow with surprising force and rapidity. All military supplies are accorded them willingly, on the general principle of helping those who fight the common enemy, and conversations have taken place in Cairo between military representatives of the British and U.S Armies, and delegates from Tito, concerning military support. But this has not satisfied the aspirations of the new "Government," which is now sending a deputation to London to demand recognition, equal footing with the Allies, representation on the European Advisory Committee which is to be set up in London, as well as on the Mediterranean Commission, and the same conditions as the other Allied countries regarding Lend and Lease.

General Mihailovitch, the C.-in-C. of the Yugoslav regular army, which never surrendered to the Nazis but maintained resistance in the mountain regions, and has continued the struggle ever since, appears to have lost influence lately. He has vigorously denied the allegations of the Partisans that he has collaborated with the Nazis, or the puppet Government under Neditch in Belgrade. Tito, as an ardent Communist, has attracted to his force all those who hope for a new world, while Mihailovitch, as a supporter of the Monarchy, is styled a reactionary. All parties are said to be represented on the National Committee of Liberation, but it has not been denied that Communists form the bulk of the supporters of Tito. This faction war in Yugoslavia causes anxiety to those who, like Turkey (a near neighbour), fear civil war will follow the expulsion of the foreign enemy.

The military exploits of the Partisans of the past year have made many forget that it was the Serbian Army, which had gained a great reputation in 1914-18, which fought the Germans in 1941. Hitler was well aware that it was the Serbs who defied him, for he declared that he would punish Serbia with the utmost severity, but Croatia, which had assisted him, would be well treated.

GERMAN TROOPS ENTERING THE TOWN OF SPLIT after a fierce battle with the Yugoslav Partisans. The latter had captured the town and held it against overwhelming Nazi forces until, finally, they were forced to withdraw

"S.S. TROOPERS CROSSING A RIVER ON THE CROATIAN BORDER in pursuit of guerilla bands"—a picture which comes from an enemy source and which shows Nazi operations in Yugoslavia

ALLIED AIR SUPPORT FOR THE PARTISANS : Dubrovnik, on the Yugoslavian coast, is held by the Germans : in response to requests for help from Tito, the port has been bombed by Allied aircraft. This picture was taken during a recent attack by the Tactical Bomber Force, and shows Mitchell bombers straddling military store-depots on shore and hitting a merchant vessel alongside the docks

A RADIO PICTURE VIA STOCKHOLM : German troops surround a house occupied by Partisans and are about to break in on the trapped men. The Germans belong to a special corps of "Partisan Hunters"

BEATING BACK THE "LUFTWAFFE" IN ITALY: Allied planes engage the enemy over Ortona, the town perched on a promontory on the Adriatic shore. The Navy, too, have been operating along this coast in harassing actions against the Germans—*Drawing by Roland Davies*

FLYING ABOVE THE ITALIAN BATTLEFRONT

The Allied Air Forces at Work along the Eastern Coast of Italy, overlooking the Adriatic

The weather conditions along the seaboard of the Adriatic have proved to be more favourable than those nearer the towering Apennine peaks. Air activity on both sides, therefore, tends to take place over the eastern seaboard when weather conditions are too troublesome inland. For several days on end all aircraft may have been grounded by the heavy rain-laden cloud cap resting over the Eighth Army battlefield. On such days our fighters and fighter bombers have been up along the coast, aiding the army wherever possible. In dirty weather the numbers in the air are small. The enemy likes fine weather for the *Luftwaffe's* efforts, and it is then that his forces of 50 and 100 aircraft come out, when the visibility is good. Here THE SPHERE'S artist shows an air battle over the rock-perched town of Ortona, captured by the Eighth Army at the turn of the year. Spitfires are seen engaging the attacking planes and forcing them away from our forces on the ground, which were then engaged in desperate fighting on the outskirts and in the streets of Ortona. The latter place occupies the site, and retains the name of, Orton, an old-time naval arsenal. Placed on a promontory projecting into the sea, it commands an extensive view of the Adriatic, the Maiella Mountains, and the distant Gran Sasso. Note, in this drawing, the snow lying on the hilltops. The two destroyers in the lower right are both vessels of the famous Hunt class

BOMBING THE ENEMY'S LINES OF COMMUNICATION BEHIND THE ORTONA BATTLEFRONT. Warhawks strafing the roads and railways leading to Chieti, just off the main highway which runs from Pescara to Rome. Scores of enemy supply vehicles have been knocked out in such raids—*Drawing by Roland Davies*

On left—

The Allied Air Forces operating on the Eighth Army side of the Italian front have been doing good work in destroying enemy transport on the roads. This has been in addition to other air attacks made on ports and rail bridges throughout Italy. There is a tangle of roads winding in and out of the ridges running down to the Adriatic shore. The enemy is bound to employ these, and some of them are none too convenient. Rail and road are often intertwined, and recent communiques have referred to thirty and forty vehicles of various kinds being knocked out at one time on these roads. One such message recorded success in the Chieti district in front of the Eighth Army. This is a busy market town just south of the main Pescara-Rome highway. The connecting roads and railways cross one another at points, as here shown. On the left is the road running up to Chieti, and, towards the right, the railway is also seen making for the town. These roads would afford relief to the congestion on the main highway which runs east and west. The roads running north and south must be nightmares to the enemy's transport controllers.

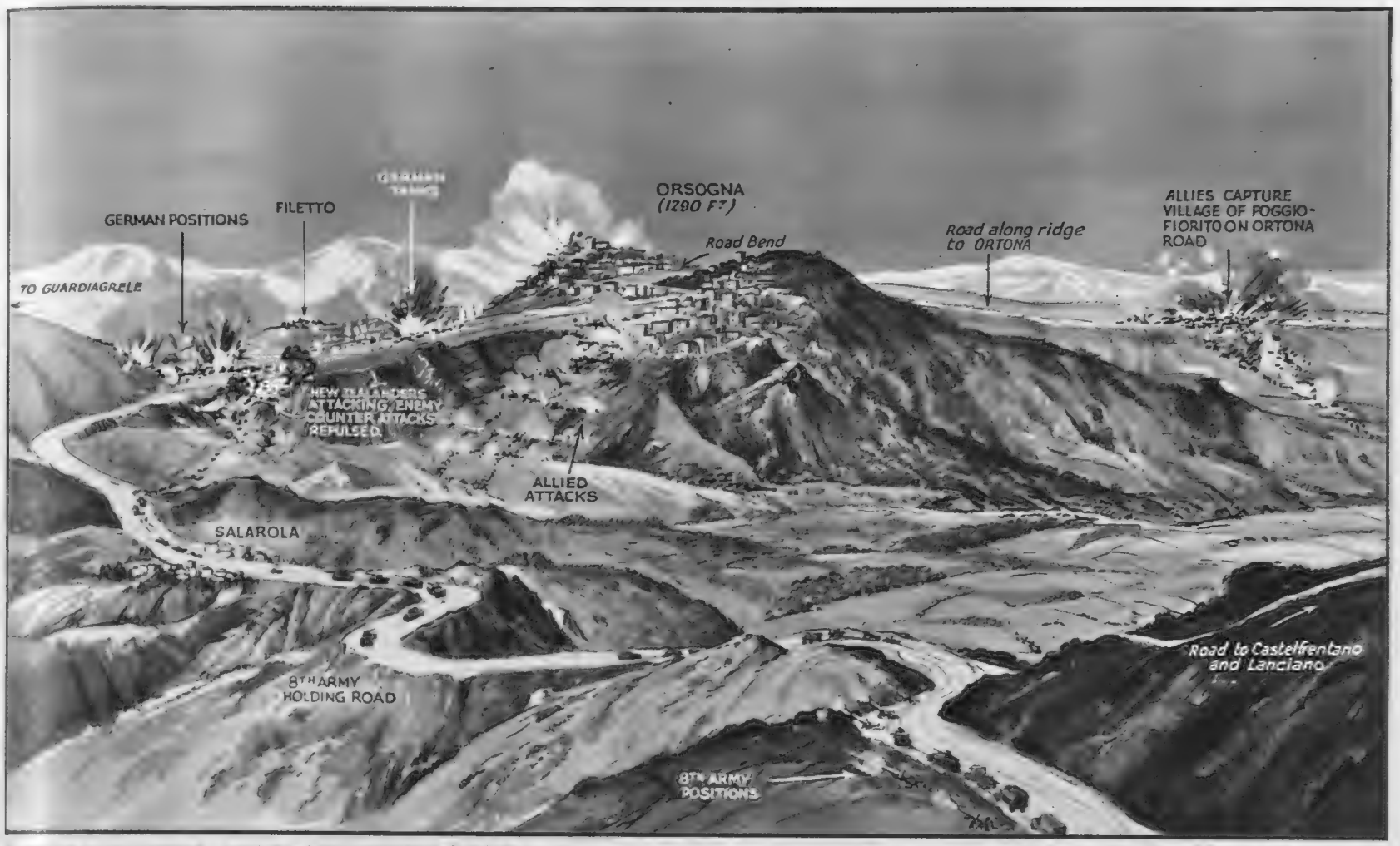
"SCORCHED EARTH" BY THE GERMANS IN ITALY: THE BURNING OF VILLAGES WHICH THEY FIND IT IMPOSSIBLE TO HOLD: These rock-perched hamlets, deserted by the inhabitants, are all on the summits of the Torricella Range, 3,000 ft. up in the Apennines *(see notes below)*—*Drawing by Percy Home*

INCIDENTS during the ITALIAN CAMPAIGN depicted by "Sphere" Artists

On more than one occasion recently reports from the Eighth Army area have referred to the burning of villages by the enemy. It has been an eerie sight to witness these hilltop towns and villages blazing away in the night, lighting the hillsides with a fiery glow. The enemy apparently wished to destroy what he could not hold, and thus deny the use of the villages to the Eighth Army. Two groups of villages have been specially detailed. One lay along the towering ridge of the Torricella, a mountain area stretching southwards along the left bank of the Sangro from Casoli to Castel di Sangro. Some of these villages actually straddle the almost knife-like summit of the ridge. This is the case with Montenero Domo, shown to the left of the drawing above. A mountain road twists along the ridge to this village, which must stand nearly 3,000 ft. above sea-level. After reaching the village the road degenerates into a rough mountain track. It is by such routes that the villagers were able to escape from their burning homes. Falla Scoso and Gesso Palena were also reported to be on fire. Further south, Roccaraso and two other adjacent villages were all reported to have been seen blazing on the hillsides. All these are close to the valley opening which serves as a gateway into the Sulmona Valley.

HOW THE ENEMY LEFT THE TOWN OF CASTEL DI SANGRO, on the Eighth Army's front, in a state of complete ruin

Castel di Sangro, well known to tourists for its beauty in peacetime, to-day lies in ruins absolutely beyond repair, as the result of the scorched earth policy pursued by the Germans. Never have the advancing British troops met such wholesale destruction before. Only twelve houses were left standing, and these escaped destruction through the failure of the explosive to detonate. Firstly, the Germans realised that the coming winter will be severe, and want to deny the Allied troops cover afforded by the towns. Secondly, this destruction is part of the German "hate campaign" against the Italian people for turning against them. Before the Germans left this town they took all cattle, food and all valuables from the churches and people's homes. From the church they stole a huge gold crucifix, from the people they took wedding-rings, watches, etc. When photographers entered, old people and children could be seen everywhere, digging among the ruins to find the remains of the food their houses formerly contained



A REGION OF FIERCE ATTACK AND COUNTER-ATTACK—THE ROAD THROUGH ORSOGNA TO ORTONA ON THE COAST. This area has been one of the most hotly contested of the whole campaign. Orsogna itself was captured and recaptured by our troops; and in Ortona street-fighting went on from house to house for days—*Drawing by E. G. Lambert*

After the initial crossings of the Sangro River, the Eighth Army captured the long ridge running down to the sea at Fossacesia. Then Lanciano and S. Vito were captured. A number of parallel ridges confronted the British forces, penetrated only by very sinuous, third-rate roads. One good secondary road leads south-westerly towards the main road to Ortona. It was along this road that the main attacks developed; the road turns due west soon after passing Castelfrentano through the village of Salarola. It is this road which appears in the foreground of the above bird's-eye view. At a point about 1,300 ft. above sea-level, it cuts into the road to Orsogna. Here at this junction, and in and about the town itself, a prolonged struggle took place, the town being captured, lost, and recaptured several times. There were stories of tank engagements; but our men were not in great enough strength for some days owing to the Sangro River again giving trouble. It is now known that the river again rose for some 7 ft., swamping the bridges in such fashion that for three days no tanks, cars or heavy vehicles of any kind could cross to the northern shore. In due time this state of things was remedied: and Orsogna, Poggia Fiorito and Caldari were entered, opening a way for the final assault upon Ortona, the town's port on the Adriatic shore. Orsogna and Filetto command the opening stretches of the road to Chieti, which again commands the Pescara highway

ONE METHOD ADOPTED BY THE GERMANS DURING THE ITALIAN BATTLES: A counter-attack carried out by massed German infantry in close formation to oppose the steady advance of General Montgomery's veterans of the Eighth Army—*Drawing by W. G. Whitaker*

For some time the enemy has been developing all the arts of defence; his thoughts are no longer on a loosely-held front line permitting of instant advance. Digging-in, zig-zag trenches, emplacements of various kinds reinforced with concrete—these are the phenomena which now meet the Allied forces. This does not mean that the enemy has altogether given up ideas of leaving his fortified positions. Directly he senses a position less strong than those to left and right, he smites with concentrated force. This has always been characteristic of German methods—to bring heavy forces to bear on the weaker spots. In some cases recently this has meant small withdrawals from exposed heights. The weight of the Allied attack by air and land has been such that the enemy employs this concentration to a local "suicidal" degree. He has been throwing in men in massed formation in an effort to stop our steady advances. It says much for the steadiness of the Allied troops that these massed attacks have been stopped and in many cases thrust back beyond his original lines

The BATTLE LANDSCAPE in ITALY

The Changes brought about by the Conditions of Modern Warfare

—Two Special Sphere Drawings

THE DANGERS OF LEAVING THE MAIN ROADS IN THE BATTLE-AREA, where the motor-vehicles become bogged in the soft ground if they attempt diversions—*Drawing by H. P. Burton*

It was stated earlier in the Italian campaign that the fighting might possibly become "roadbound"; and that our own commanders were becoming "too road-minded." If they were to witness the state of the countryside both in front of and around the Fifth and Eighth Armies, these critics would at once perceive that "road-mindedness" was well-nigh unavoidable. Fairly hard-surfaced roads are only too apt to break up under the weight of the heavy vehicles which rumble over them. Shell-fire and bombing may further damage the roadways. Woe betide the driver who seeks to take short cuts across meadow-land! Tanks and lorries will almost at once be waterlogged, the surface layers of the soil being rendered so soft by the continuous rainfall that tracks and wheels sink in dangerously. One correspondent writing at the end of the year, when discussing possible tactics on the Italian line, has stated that "any attempt to fan out in the old desert fashion must hopelessly bog our vehicles at the outset." The above scene, depicting a roadway in the Camino-Venafro area, illustrates the dangers which beset any diversionist from the highway

A NEW FEATURE OF THE ITALIAN SCENE, the result of intense shelling and bombing. The uprooted trees which everywhere litter the roads and fields after the heavy actions on the Fifth and Eighth Army fronts—*Drawing by W. G. Whitaker*

Recent reports from the Italian front have contained descriptions of the wreckage of war to be witnessed along the roads leading to the front. Wrecked tanks, guns, armoured vehicles, and smaller mechanical details are everywhere visible. But now a new feature has come into the scene—due, evidently, to the increase in the massed shelling and to the heavy air bombing in particular areas. This new feature is the destruction of the trees of the countryside, both in the Fifth and the Eighth Army areas. A correspondent in the Mignani district writes that "practically every tree in the district has been blasted to the ground and there are shell-holes and bomb-craters every few yards." Of course, this is in an area of very intense activity. A correspondent with the Eighth Army, describing the havoc to trees in his area, says that the whole scene was desolate in the extreme, one feature which added to the general macabre effect being the torn and splintered trees. Many of these are olives, of which thousands dot the landscape

WAR NEWS IN PICTURES

A BRITISH DESTROYER'S HAUL : A captured German I-boat after it had been sailed into Brindisi Harbour under a prize crew. On the night of November 9-10, H.M.S. *Quilliam* and H.M.S. *Raider*, two destroyers of the Fourth Flotilla, intercepted a Siebel ferry with an escort of two German I-boats off Corfu. The ferry, containing ammunition, was blown up with *Quilliam's* third salvo, and the I-boats were chased on to the beach near Port Balermo. A whaler from the British warship was put out after the area behind the beach had been "softened" by pom-pom and Oerlikon fire. One I-boat was towed back to the ships: the other, which was fast aground, was thoroughly examined before being sunk by gunfire from the destroyers. The captured I-boat was towed to within a few miles of Brindisi and then sailed into the port under a prize crew

A MASKED MAN DESCRIBES THE FRENCH "UNDERGROUND": This unidentified masked speaker, a former French deputy who has been working with French patriots, told a meeting of industrialists in New York on December 9 how American weapons are being used in the French underground movement. Fear for his family and for those of his friends who are still in France was the reason for his concealed identity

BELGIAN COLONIAL TROOPS ARRIVE IN NIGERIA: Infantry drawn up on the quayside of a British port. These soldiers from the Congo are wearing British equipment, but are armed with Belgian rifles. Their head-covering is a red fez, with neck-cloth attached. They wear puttees, but thick-soled sandals instead of boots. Fully-trained and well-equipped Colonial troops from the Belgian Congo are now serving in British West Africa. The whole resources of this great African territory are pledged to the Allied cause, and Belgian Colonial troops have already served with distinction in the Abyssinian campaign

THE GOVERNOR OF NIGERIA, SIR HENRY BOURDILLON (centre in white), looks on while Brigadier Richards (right) greets Major Vuylstek de Laps, Officer Commanding a battalion of Belgian Colonial Infantry, now serving in British West Africa. This picture was taken during the disembarkation

FRENCH NURSES IN THE FRONT LINE IN ITALY: An operation in progress in the theatre of a Field Ambulance just behind the fighting line. French Moroccan troops are fighting on the right flank of the Fifth Army

A GROUP OF FRENCH NURSES WASHING INSTRUMENTS before sterilising them for an operation. French nurses and women ambulance-drivers are now operating in forward hospitals with the French Moroccan troops, who are now in the line on the right flank of the Americans. These two pictures were taken at a Field Ambulance Station situated within range of the German artillery. Nurses and drivers are all volunteers who have recently arrived in Italy from North Africa

The COAL-MINING INDUSTRY of BRITAIN

II—What the New Trainees Will Have to Learn

The Second of Three Articles Dealing with Conditions Underground, After a Series of Personal Visits to the Mining Areas

By CHARLES GRAVES

THE decision of Mr. Ernest Bevin to direct youths from all walks of life into the coal-mines on a ballot system has caused mixed feelings and given rise to conflicting opinions. On the face of it, as a means of getting more coal immediately and tiding us over the next few vital months, the scheme would appear to have little practical value. A speaker in the recent debate in the House of Commons—one who has first-hand knowledge of the coalfields—anticipated that half the new entrants might be "in full production" at the end of twelve months, and the remaining half at the end of eighteen. Other more conservative, or it may be more pessimistic, opinions are that it takes at least two full years' training before a man with no previous experience is competent to cut coal at "the face."

There is, however, an intermediate opinion that these directees will not themselves get as far as the actual coal-face before the end of the German war; but that they can, and will, replace other men now working underground but not at the face, who can then be advanced or upgraded to become cutters and fillers, and thus help substantially to increase the output of coal in the not too distant future.

In any event, there is this to be said for the scheme. It will bring new blood into the coal industry and will serve to disabuse thousands of people, both parents and their sons, of the exaggerated stories in circulation about the hardships of the miners. Mind you, I should hate to be a miner. My primary reason for this is purely personal. I am 6 ft. 3 in. and broad in proportion. In consequence, even thick seams of coal would cause me considerable discomfort at the face. Thin seams of coal—anything from 11 in. up to 3 ft. 3 in.—would give me acute discomfort. I would probably incur anything from beat knee (the collier's equivalent of housemaid's knee) to beat elbow (his equivalent of tennis elbow). I might even suffer from beat hands, for which there is no equivalent. In the best laid-out mines I should have to duck pretty often between the bottom of the shaft and the place where I was supposed to cut coal. The truth is that, for comfort, you do not want to be more than 5 ft. 6 in. in height if you are to be a coal-getter.

A SCENE AT THE COAL FACE: A mechanised cutter operated by two men; the latter are wearing their special protective clothing—helmet with lamp attached, gauntlets and knee-pads

Nature is wonderful. In Northumberland and Durham, where coal has been mined continuously for six centuries or more, miners and their sons for generation after generation have rarely exceeded 5 ft. 8 in. in height. This pedigree of coal-mining is an important point. Coal-getting is in the blood of tens of thousands of British citizens. They have been metaphorically brought up on coal. Quite unconsciously they have learnt "pit sense" at the breakfast-table and the dinner-table. Long before they went into the mines they were coached instinctively by their fathers, elder brothers, uncles, and even grandfathers. Coal-getting has become an hereditary craft. In many cases it is a combination of intuition, subconscious anticipation, and latent skill. Most people think of coal-mining as a comparatively recent industry. It is a safe bet that if you asked anyone when coal-mining started seriously in this country, some date in the late eighteenth century would be given. This is far from being the case.

Now what about the boys who are to be directed to the coal-mines? Many of them will have no hereditary gift for it. They will, in fact, be as green as the grass above the pit. What is to happen to them? The answer is that every possible care will be taken to see that they learn the first steps in their trade in complete safety above the ground, and that for months they will be cautiously trained in subsidiary roles. The Ministry of Labour's training schedule is notably vague. This is, perhaps, just as well, for the vagueness of the training scheme will enable experienced colliery managers to train the youths by methods far more practical than Whitehall civil servants could possibly dictate. Nor will this be a particularly difficult job for the colliery executives. Most of the more enlightened ones already possess their own schemes for training juveniles, volunteers, and optants for work in the mines. One of the colliery undertakings which I visited is the pioneer in a scheme of training which has an exact parallel in the Army, where privates, after a period of time in the ranks, secure commissions through O.C.T.U.'s. In this case the commission is the post of under-manager, which sets the youth on the rung of the ladder towards his ultimate goal of being managing director of the colliery concern.

I have seen the training schemes of several enlightened collieries. In drawing up their training syllabus, it is clear that they have borne the following points in mind:

(*a*) The men who are to take the training are coming into the mining industry as an alternative (compulsory or voluntary) to military service.

(*b*) Many of them will leave the industry at the end of the war.

(*c*) Interest, even though temporary, must be created and stimulated.

(*d*) Many will come from districts where little is known about coal-mining.

(*e*) Training must be descriptive and, as far as possible, free from technicalities, and yet be practical with the object of (*a*) maintaining the highest degree of safety, and (*b*) enabling the trainee to do a useful job of work in a minimum training time.

With all this in view, the training course has to cover all sorts of aspects. The vast majority of you have no idea of the way in which a coal-mine works. You think vaguely of a hole in the ground, a few tunnels, and someone hacking away at the coal-face, the result of his labours being put in a tub and ultimately drawn to the surface, where it is put into railway trucks and sent to the coal merchants and coal factors. It is not, of course, as simple as all that. A coal-mine is a highly organised as well as a highly mechanised undertaking; in which, however, nature is always playing a hand, and where new problems crop up every day.

A trainee has to learn all about protective equipment—anything from a safety lamp to a safety helmet. He has to learn about coal and adjacent rock, surface lay-out, winding, pit-bottom arrangements, handling and coupling tubs, signals, the attachment and detachment of tubs, haulage ropes, the methods of working coal, coal-cutters and conveyers, and above all, roof-support, which involves packing, chocks, and other supports at the face, together with the withdrawal of supports. He must know about impurities in the air, the importance of ventilation, the different type of lamps, explosions caused by fire-damp, the danger of coal dust, the use of explosives in shot-firing, the care of switch-gear and cables, elementary first aid, and the chief causes of accidents. Even this is just skimming the surface of his training. It will be after several weeks of lectures, talks, educative films, and other experience gained on the surface level that he goes underground. Even then his participation in coal-cutting will be purely spectatorial. It will be many months before he has any real effect on the actual production of coal.

Every possible care will be taken to see that the Young Entry are protected from the most hypothetical dangers. They will be compelled to

DRILLING A SEAM FOR SHOT-FIRING: The men are close up to the coal face, crouching as they work with a mechanical drill. Later, a mass of coal will be brought down by the charge, freeing it for the men who actually have to gather it up

wear safety helmets, sometimes known as hard hats. This may sound unnecessary, but the fact remains that in Northumberland I visited a coal-mine where less than 65 per cent. of the miners would condescend to wear this invaluable device. They will be compelled to wear safety boots, although 20 per cent. of the miners in this country refuse to wear them. They will be compelled to wear protective leather gloves, although only 50 per cent. of miners can be persuaded to wear them. They will be compelled to wear knee boots and shin guards and, where desirable, yorks (those leather straps worn just below the knee). They will, no doubt, be encouraged to wear overalls below ground, although scarcely one miner in 500 does so, preferring some elderly suit of his own. They will be compelled, in fact, to take every safety precaution. They will not be allowed to skimp the proper locking of shackle pins between the tubs; they will not be allowed to walk along the haulage roads at unspecified times. There are dozens of things which they will be forbidden to do which the regular coal-miners (with the usual familiarity bred of contempt) will do. They will also be taught real discipline, which the average collier despises and refuses.

They will need to learn about wood and steel roof supports, posts, rings, straps, flats, steel cogs, lids, compression pieces, and wages. They will be taught about rails, wooden sleepers, steel sleepers, concrete sleepers, clamps, bolts, keys, packing material, points, crosses, monkey

WHAT A COAL-MINE LOOKS LIKE: One of the main roads, showing the conveyer belt which carries the coal to the pitshaft

A MOTHERGATE CONVEYER delivering the coal into tubs on the main haulage road through the pit

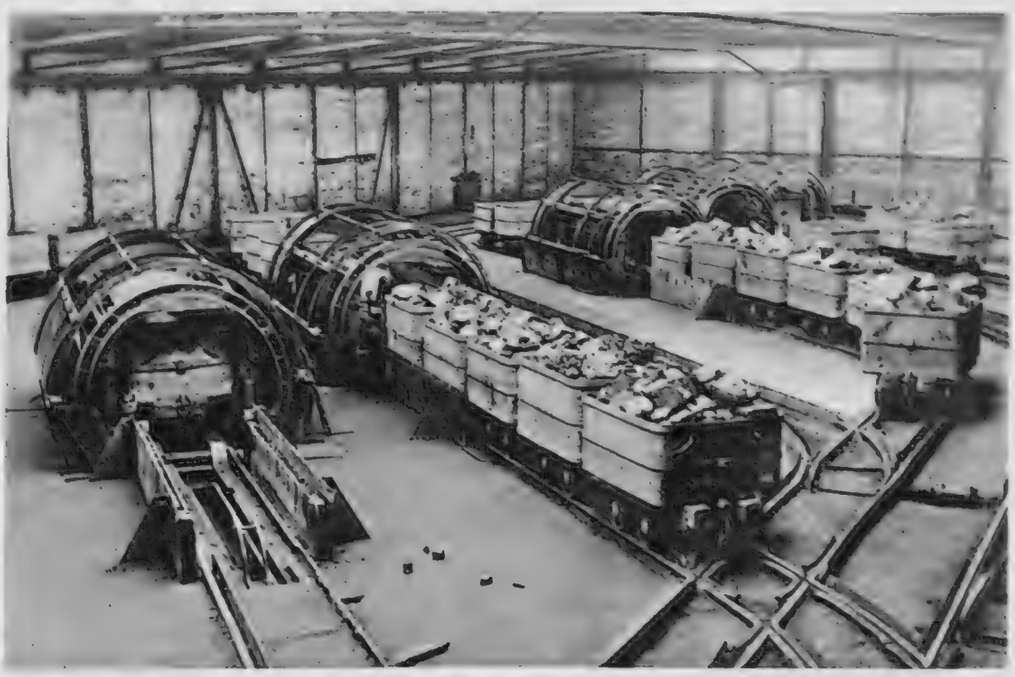
catches, bar hooks, and check rails. They will learn about endless haulage, compressed air, pneumatic picks, and every kind of safety appliance.

In view of the universal black-out, they will find that conditions are very little different from those reigning in any late shift in a factory above ground. The air will be just as good, probably better. They will find themselves in a new world which (in the case of all the modern coal-mines) resembles the Tube system in London to a remarkable degree. If they are lucky, they will be taken on a kind of underground railway from the bottom of the shaft to the place where they are working. There will be much silence, interrupted by loud clanging sounds; and unless they find themselves in a district where the coal dust is particularly penetrating and cloying, they will come to the surface surprisingly clean until they reach the advanced stage of becoming actual coal-cutters. Incidentally, their pay will be out of all proportion to what they would have got in the three fighting Services.

It would be ridiculous to suggest that many of them will like the conditions of the mining villages in which they are billeted. Some, of course, may be lucky. But even the remainder will be a great deal more comfortable than they would be in barracks or under canvas, as they would otherwise be if they were in the Services. What is more, they will acquire much more information and experience which will be practical to them in peacetime than the use of a Hawkins 75 grenade, the rate of fire of an Oerlikon, or the use of oxygen in a high-altitude bombing raid.

It is hard to say whether the professional coal-miners, who are the most conservative people in the world, will cold-shoulder them, or whether they will heap confidences upon them. It is certain, however, that the youths will acquire an experience of life which, even if they do not make a career of coal-mining, will be extraordinarily useful to them in after life.

A BAND OF MINERS, lamps in hand and ready for a shift underground, go below in the "cage"



THE TUBS LADEN WITH COAL ENTER THE "TIPPLERS": Later the mine's output will be sorted and classified before being despatched to consumers throughout the country

The World of Books—By Vernon Fane

OF PEOPLE, PLACES AND PURSUITS

An Intimate Biography of Queen Victoria ; A Pleasing Indian Cameo and an Indian Political Novel ; Amateur Activities in the Country

NOTWITHSTANDING a prefatory statement that previous studies of Queen Victoria's reign have been, generally speaking, too domestic, Sir George Arthur has written one of the more intimate and entertaining accounts of this lady's private life that I have yet read. CONCERNING QUEEN VICTORIA AND HER SON (Robert Hale. 12s. 6d.) deals with the period between 1837 and 1901, and although it appears to be one of the author's intentions to show Queen Victoria as a great power in world affairs, and to indicate the influence that she brought to bear on foreign politics in effect, this book will probably be remembered for its enchanting glimpses, few of which I remember seeing recorded before, of domestic detail.

I liked particularly the candid assessing of Victoria's sense of humour. Sir George describes her as nearly dying of laughter when Lord Kinnoull was showing her round a Scottish castle in 1842, and, in the course of this excursion, rolled down a steep bank. " That the old gentleman, who was sometimes not quite sober, might have hurt himself, was no matter. It was the sort of first cousin to a practical joke which appealed to Victoria's not very subtle sense of humour ; it was always a pleasant relaxation from serious thoughts to see anyone trip up over a rumpled hearth-rug or slightly bark his shins against a coal-scuttle. When a small figure clad in pink satin drove to attend a banquet at the Guildhall, what pleased her most was to see one of the aldermen roll off his horse in an attempt to bow to a lady friend seated at a window."

The author is equally revealing about the foibles, as well as the talents, of the Prince Consort ; of his stiffness and coldness, of his integrity, of his culture —" cultured he was to concert pitch "—and of his refinement, which never permitted the coarse jesting of the period and which many of his contemporaries thought affected.

Most interesting of all, however, are the chapters on the Queen's difficult relations with her son, the future Edward VII. She had not been brought up in the easy relations in which modern parents exist with their children, and the strict views of the Prince Consort, which she felt unable to modify after his death, as to education and conduct made things harder still. It was largely to that Edward's own credit that it could later be said of him by a great diplomat : " *Sire, vous êtes un grand diplomat et un veritable homme d'etat.*"

RUNGLI-RUNGLIOT (Peter Davies. 8s. 6d.) is another of Miss Rumer Godden's slight but delightful books about the India that she knows. It is not a novel, but an account of a few wartime months spent at a village in the Himalayas. The title, we are told, means " Thus far and no further," and the notes themselves, as the author calls them, are about :

Chinglam and its hills and valleys,
Work,
Flowers,
Children,
Animals,
Servants.

" There is nothing else," she writes, " because there was nothing else."

It is, in fact, a short diary of notes and impressions made during a winter's stay in an isolated house on a Himalayan tea-plantation. Miss Godden went up there with her two children, their Swiss nurse, the *ayah* and a few servants. The house was small, the owner of the plantation lived several miles away, and the nearest town, Darjeeling, was eighteen miles off. In this near-isolation the little family lived happily for several months, and the notes on her stay there, together with a few dried lemon leaves which she brought back packed among those pages, were all that remained of the stay until this book was written. Its purpose has been to distil the essence of that time, and this, with her customary delicacy of thought and recollection, Miss Godden has done most completely.

There are many passages which I would enjoy quoting if there were space ; the description of the new Pekinese puppies, the accounts of tea-plucking, and the constant and delightful stories about the children, Rafael and Sabrina. Rafael, at five, was both a letter-writer and a poet. She was also a realist, as witness her verse :

Rose, Rose,
I pick you often
And put you into a vase ;
But when you die of life
I throw you into the bucket.

But then the whole book is a delightful affair, and I recommend it unreservedly.

One of this week's most delightful novels is a contemporary Indian political romance, COMEDY IN CHAINS (Gollancz. 7s. 6d.). It is full of charming unfamiliar people, amusing situations, and is written with a good deal of wit and humour. It offers a vivid picture of modern wartime India, and it shows the enmity felt by many Indians towards the Empire and the British *Raj*. But the politics, and even the story, are less entertaining than the pictures of individuals.

In 1939 Dr. John Ananda Cummings, a young Eurasian educated in England, saves the life of thirteen-year-old Gopala, a temple dancing girl, who faints during an Indian village festival. Ananda buys the girl from her unscrupulous guardian, and by bribing the police contrives to have her kidnapped and installed in a worthy Indian Young Ladies' High School in Madras.

His new friendship with Pandit Banerjee, a venerable member of Congress and disciple of Mr. Gandhi, leads to a position in the Banerjee Hospital fighting a cholera epidemic. Times change. In September Britain's declaration that India is at war provokes active political unrest and much underground dissatisfaction. Pandit Banerjee is imprisoned twice, first on a charge which is disproved and then on no charge. His son, Rukku, also a political worker, later marries Gopala, though she is hardly more than a schoolgirl, and Ananda marries Rukku's sister, Lakshmi. The story closes with the imprisonment of Ananda for his connection with Congress supporters.

Mr. Dennis Gray Stoll is an author who understands the psychology of Indian people, and who can write of bitterness and anger with a deadly lightness of touch. I commend to the reader particularly the schoolgirl's first letter : " To-day we had polished rice and fish curry, but I sat at the wrong table first and got unpolished rice. So I had both sorts. As regards myself, I am well but weaping . . . however I found a littel friend and I have managed to show her a thing or two. . . ."

There is smali doubt about Mr. Stoll's political bias—and as he has not yet visited India, the book comes also as something of a *tour-de-force*.

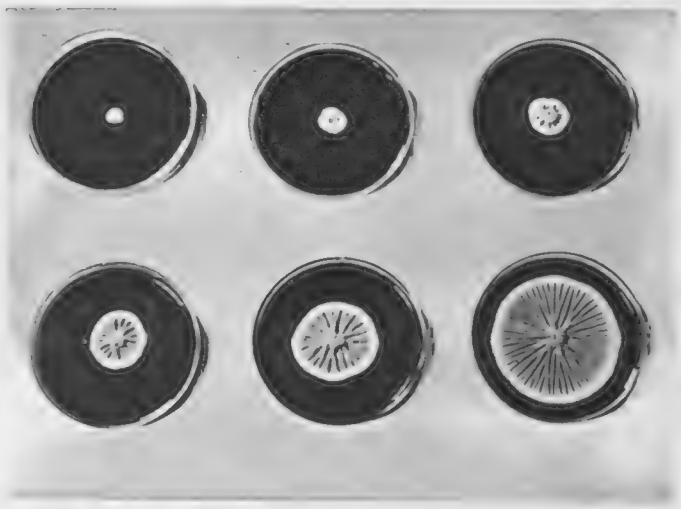
Mr. Clifford Hornby is a young man who has been all over the world taking photographs for film companies. At present he makes training films for the Forces and for the Ministry of Agriculture, and his book, RURAL AMATEUR (Collins. 8s. 6d.), is a pleasant, rather shapeless collection of notes on country pursuits.

As a boy, Mr. Hornby began to take an interest in falconry—an interest that was to become a passion under the expert tutelage of Captain C. W. R Knight, whom he met when he was lecturing on hawks. At the end of his talk the boy went over and said the few words that were going to admit him into that special world. " ' Er—Captain Knight ? ' He smiled and his answering ' Yes ? ' invited further speech, the easy opening loosened the boy's tongue. ' I have an owl,' he said, and told hesitatingly of his find in the dealer's canary cage. ' Do you ever fly it ? ' asked Knight, and seeing the boy's incomprehension, told him of an owl he once had that would fly like a trained hawk. ' Come down and see my falcons one day,' he said. . . . The boy walked out into Regent Street unaware of the world about him, so completely was he under the spell of the first man he had met whose enthusiasm had embraced and expanded his own shy longings."

From that moment Mr. Hornby was, as it were, sold on falconry, and I think that by far the best passages in his charming but inchoate book are those which deal with these hunting birds, their care and their characters. His writing about other aspects of country life is less distinguished, but when he is writing with a great deal of enthusiasm about a subject on which he is an expert, that zest communicates itself to the reader.

THE DISCOVERER OF PENICILLIN : PROFESSOR ALEXANDER FLEMING, F.R.S. Immediately in front of him in his laboratory in St. Mary's Hospital, Paddington, are type specimens of the common mould *penicillium notatum*, from which the wonderful drug is extracted, growing on culture plates. The seven blackish discs in the immediate right foreground are specimens of the same mould being used in experiment with other drugs and mounted, for demonstration purposes, on black paper

In the general opinion of medical research experts—men not given to hasty, ecstatic judgments on new advances in healing—penicillin is already being acclaimed as one of the most important discoveries of medicine. Penicillin is a tremendous advance even on those other " silver bullets " of medicine, the sulphonamide drugs. For it will cure a whole range of diseases—" killer diseases " which the sulphur compounds will not touch. It will do so with ease and certainty, and with a rapidity which is spectacular and dramatic. Unlike the sulpha drugs, too, it is (as far as is known) completely without any toxic or other unfortunate secondary effects on the patient



HERE ARE SOME SPECIMENS prepared by Professor Fleming himself, of the mould from which penicillin is extracted, growing in culture dishes on agar-agar jelly. From the top to the bottom right, the rate of growth is shown from one to ten days

SMALL AMPOULES, EACH CONTAINING A STANDARD DOSE OF PENICILLIN—a pinch of orange powder—which has been " freeze-dried " and is ready for mixing with sterile water for injection into the patient. Nobody has yet ascertained exactly what each of these doses is worth

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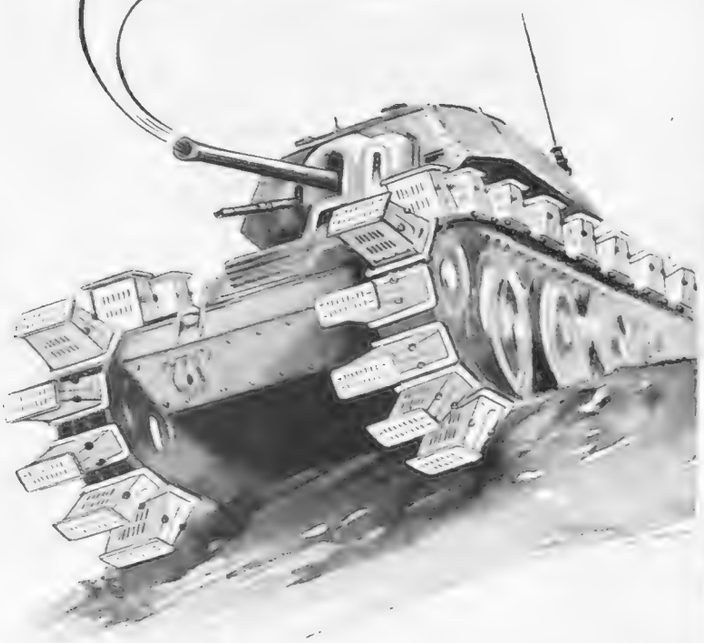

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* * *

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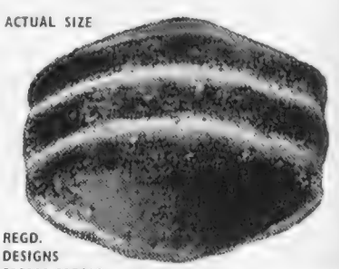

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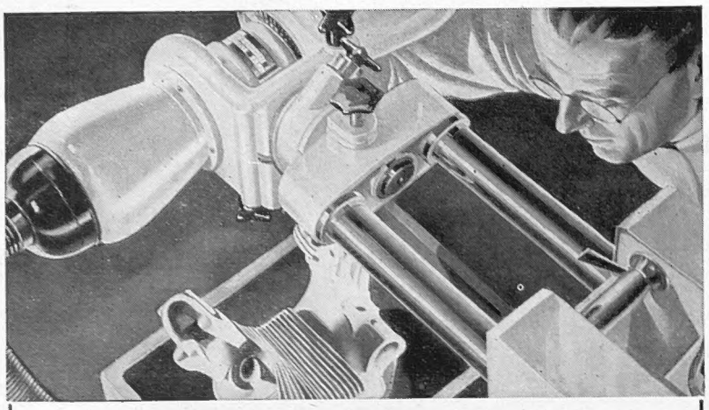

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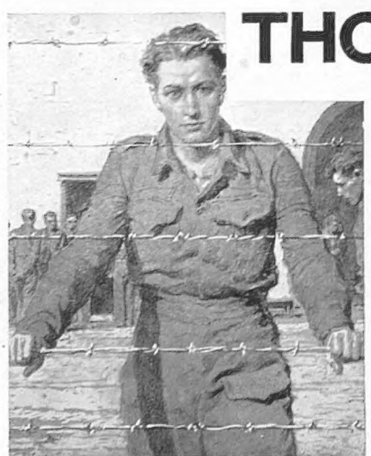

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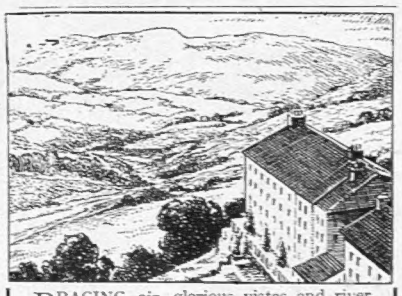

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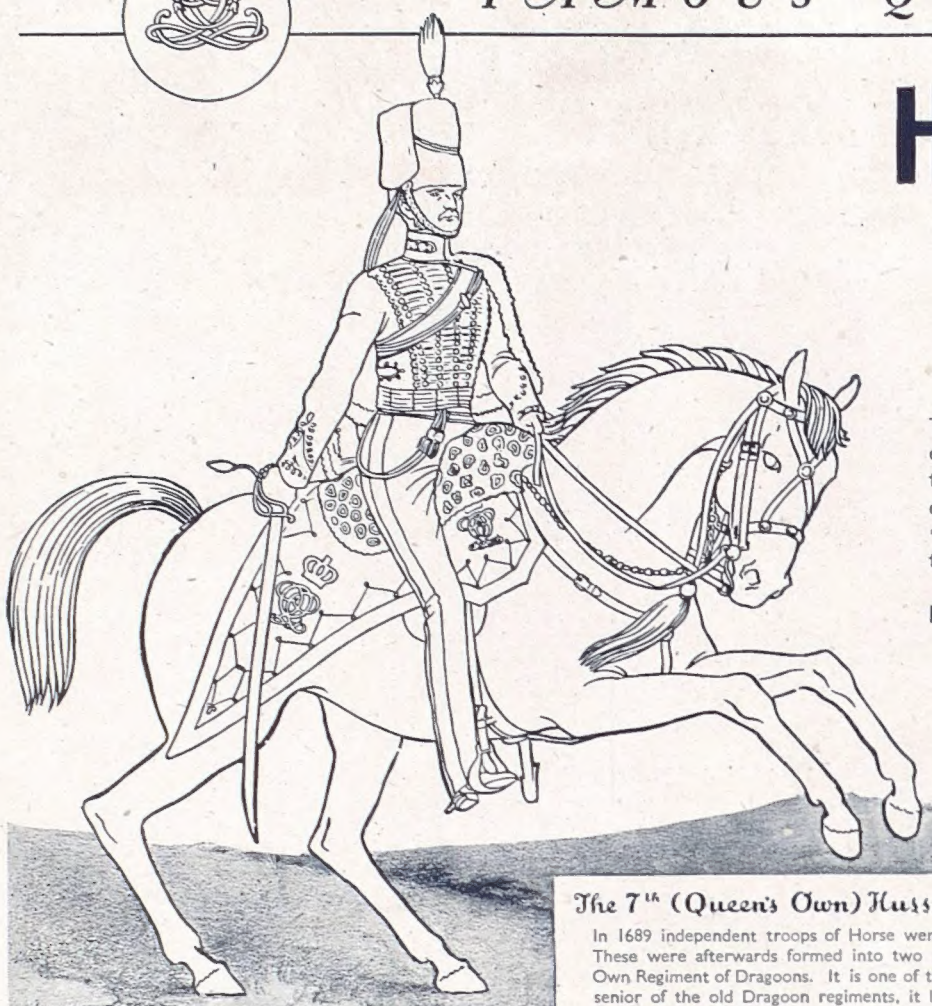

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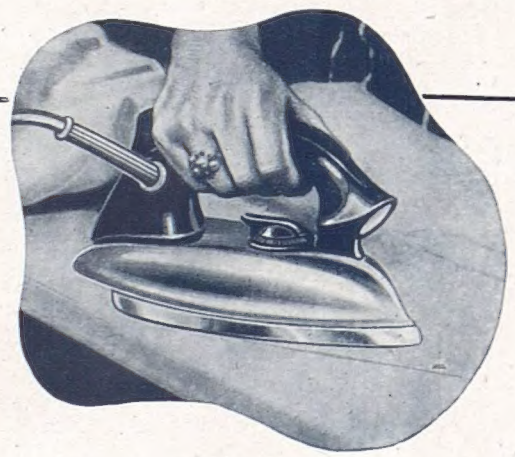

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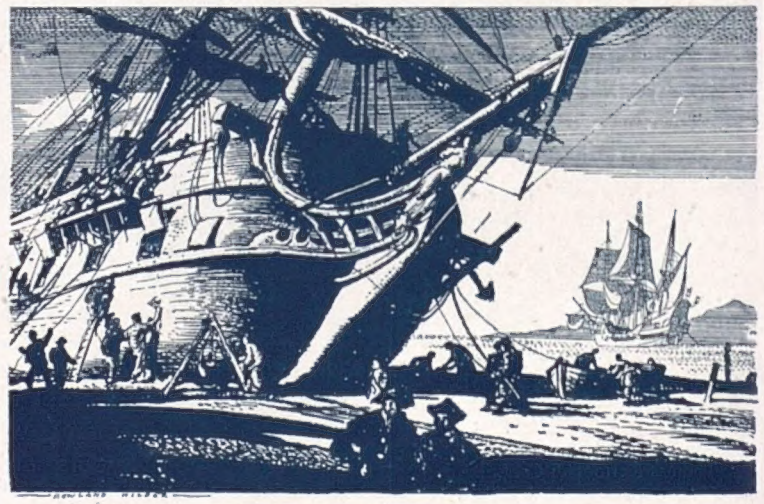

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ONE of the toughest and most tedious jobs in the days of the Jolly Roger was scraping weed and barnacles from the ship's bottom for re-painting or tarring. Indeed, scraping off old paint or fouling from any metal, particularly rust and scale from iron or steel, was always a slow, backbreaking job, until the scientist evolved the oxy-acetylene flame brush. This simple yet ingenious tool wipes off old paint, rust and dirt almost as fast as the hand can move. It does more. It thoroughly dries the metal so that no damp is left in its pores . . . and the new paint really binds. Hence a double economy—the job is more quickly done and, once done, lasts longer. These and many other labour-saving tools are being constantly improved by the scientists of Britain's liquid oxygen and compressed gas industry, which produces and distributes each day millions of cubic feet of oxygen and acetylene, to say nothing of nitrogen, argon, helium, and other gases needed for medicine and industrial purposes.

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